**DEPARTMENT OF THE ARMY**
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

DAIM-FD

26 JUL 2004

MEMORANDUM FOR SEE DISTRIBUTION

Subject: Sustainable Project Rating Tool (SPiRiT) Validation Report

1. In June 2003 the Assistant Secretary of the Army Installation & Environment asked the ACSIM to show how the Army ensures that the MILCON project sustainable policy and scoring process is working and that SPiRiT ratings are valid.

2. The OACSIM established a validation team that reviewed the SPiRiT assessment scoring process and ratings of six projects from the Fiscal Year 2002 MCA program.

3. Enclosed is the final report resulting from this effort. A copy of this report is available at http://www.hqda.army.mil/acsimweb/fd/linksSDD.htm.

4. My point of contact on this action is Mr. John Scharl, DAIM-FDF (703) 601-0700, john.scharl@hqda.army.mil.

5. Quality Facilities for Quality Soldiers!

FOR THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT:

Encl

JOHN B NERGER
Director, Facilities and Housing

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SUBJECT: Sustainable Project Rating Tool (SPiRiT) Validation Report

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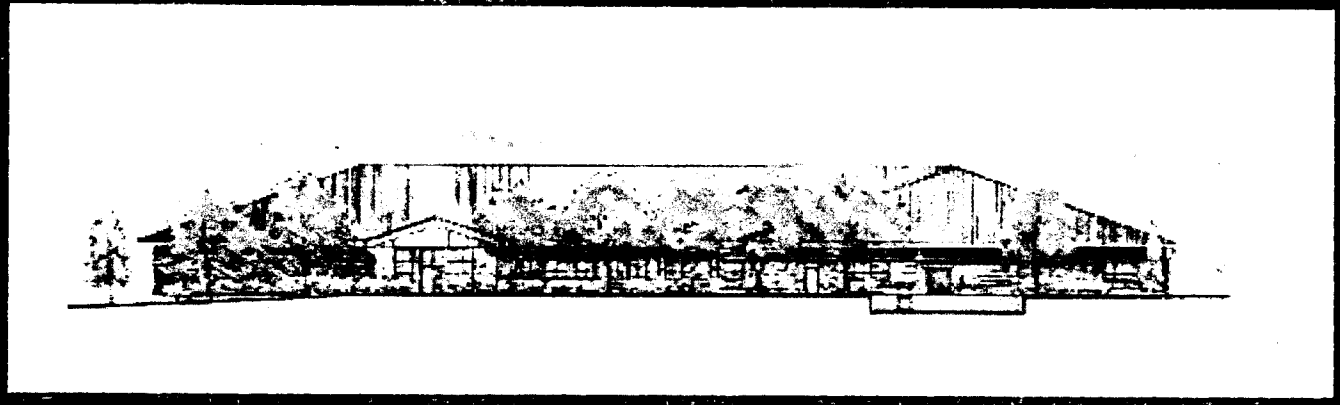
FINAL DRAFT

# Validation of SPiRiT Process (Sustainable Project Rating Tool)



U. S. Army Assistant Chief of Staff for Installation Management


Validation Team:
ACSIM: John Scharl
IMA: Cecil Goodwin
USACE: Harry Goradia
ERDC: Richard Schneider


September 2003

FINAL DRAFT

# Executive Summary:

## Summary of Project Validations:

**Purpose:** To demonstrate that the Army has a credible way to validate Sustainable Design And Development (SDD) / SPiRiT scoring process. The teams goals were to validate the application of the SPIRIT self assessment process, field any questions/concerns the Project Delivery Team (PDT) had with the SPIRIT process, identify their lessons learned while applying the SPIRIT process, and to provide recommendations to enhance the SPIRIT process.

**Objectives:**

- Select at least two projects from FY02 MCA program list that have a Beneficial Occupancy Date (BOD) of 2003 and are closest to completion;
- Evaluate and report the validity of each projects SPiRiT assessment and rating (s);
- Identify Findings/Observations/Issues/Lessons-learned;
- Provide recommended follow-on actions; and
- Complete Final report by end FY03.

**Projects:** The following FY 02 MILCON program projects were selected after reviewing their DD1391s and based on their estimated beneficial occupancy dates occurring closely within calendar year 2003.

1. Fort Lewis, WA - Whole Barracks Renewal, NF Area, Phase 1
2. Fort Richardson, AK - Barracks Complex - D Street, Phase 2
3. Fort Polk, LA - Consolidated Library/General Education Center
4. Fort Gordon, GA - Installation Communications Facility
5. Fort Meade, MD - Child Development Center - NOT designated showcase project
6. Camp Carroll, Korea - Physical Fitness Training Center – NOT designated showcase project
7. Camp Jackson, Korea – General Instruction Building – Project CANCELED

## Summary:

Based on the material provided and discussions held during site visits, the validation team concluded that the Corps of Engineer District Project Managers/Design Teams were minimalists in setting their SPiRiT project goals and conservative in taking points when scoring the projects. The one exception was the Fort Gordon 'Installation Communications Facility' project. The Fort Gordon Project Design Team met the "spirit" of the Army's SDD/SPiRiT policy by applying these key elements of sustainable design:

- Establish an Integrated project Team early in projects conceptual phase that includes the key representatives from the Installation (DPW and building user);
- Project team apply and sustain a holistic plan, design and construct approach through out project to completion;
- Training project Team on SDD/SPiRiT;
- Set SPiRiT Rating Goal(s) and conduct SPiRiT assessment as early as possible
- Update SPiRiT Score from Project Parametric (Concept) Design Charrette, during design reviews, through Project Beneficial Occupancy Date (BOD) (construction completion and actual occupancy); and
- Document SPiRiT points assessment/scoring rationale.

The validation team re-scored each project based on the information provided, discussions held and team's extensive knowledge of SDD and SPiRiT. With the exception of the Fort Meade and Camp Carroll projects the team's evaluation validated higher SPiRiT scores than each of the Project Design Teams (PDT). The changed scores resulted from differences in interpretation of the SPiRiT criteria requirements.

**Project Validation Findings:**

| SDD/SPiRiT Key Elements | Lewis | Richardson | Polk | Gordon | Meade | Carroll |
|---|---|---|---|---|---|---|
| **Self-Assessment Score/Rating** | 31/Bronze | 25/Bronze | 50/Silver | 68/Gold | 40/Silver | 32/Bronze |
| **V-Team Score/Rating** | 43/Silver | 26/Bronze | 55/Gold | 70/Gold | 38/Silver | 28/Bronze |
| **Leadership Commitment** | Yes | No | Yes | Yes | No | No |
| **Establish Integrated Team** | No | No | No | Yes | No | No |
| **Design Team Key Reps** | Yes | Yes | Yes | Yes | No | No |
| **SDD/SPiRiT Team Training** | No | No | No | Yes | No | Yes |
| **Plan/Design Charrettes Including SDD** | No | Yes | Yes | Yes | No | No |
| **Set SPiRiT Goals** | Yes | No | Yes | Yes | Yes | No |
| **SPiRiT Scoring Throughout Project** | Yes | No | Yes | Yes | No | No |
| **Document SPiRiT Scoring** | Yes | No | Yes | Yes | No | No |
| **Project Costs w/in PA** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Design-Build** | No | No | Yes | Yes | Yes | No |

## Observations:

The SPiRiT policy was issued in June 2001 after many FY02 projects were defined and firm Program Amounts (PA) were established thus minimizing opportunities to enhance sustainability of the projects. Considering the timing of the SDD policy for FY02 projects, the Project Delivery Teams (PDT) we met with have done an exemplary job implementing the Army's SDD/SPiRiT policies prior to more emphasis being placed on raising the project's SPiRiT rating. In most instances the PDTS we met with were enthusiastic about SDD/SPiRiT and want to do the right thing.

Based on the review and validation of these six projects, it appears that PDTs can achieve at no increased costs, the SPiRiT Silver level for all projects and low Gold for most projects

The present project approval process seems to minimize consideration of benefits derived from sustainable practices UNLESS the project's estimated costs are under the programmed amounts (PA) and are "lifecycle" effective. Some installations, like Ft. Lewis may have a long-term sustainability plan with Gold and Platinum SPiRiT project goals, but the added costs of implementing such a plan are unrecognized by the present MILCON program process.

Some Design Districts are extremely reluctant to seek bids for enhanced sustainability due to the fear of exceeding the project's PAs.

The SPiRiT instructions are currently mute on how to score and rate multi-category building projects. Updated SPiRiT guidance is needed to provide a consistent method of scoring multi-building projects.

Having leadership and staff commitment and participation is key to the success of any program, especially one that encompasses the life cycle of Army installations and their facilities. The observed levels of SDD commitment, awareness and participation at installations/DPWs, appears to be inconsistent and minimal. Installation Master Planners and Energy Managers need to be actively engaged in SPiRiT assessments as early as possible in the project concept/definition phase. Master planning and energy management decisions can significantly effect the final scoring of the project.

The current approach for approving MILCON projects is primarily "first costs" based with little or no real consideration of life-cycle savings in terms of energy, operations and maintenance and building occupants productivity. This is one of the greatest concerns and inhibitors regarding achieving true sustainability in Army designs and projects. Present policy also limits installation costs shown on the DD 1391 to stay within the DoD approved unit cost construction factors and further prohibits a separate line item for sustainability. These MILCON programming and approval rules/practices serve as a significant inhibitor for Districts and installations PDTs, who if they consider life cycle cost effective measures at all, do so only when the project first costs remains below the project Program Amount. These MILCON program policies and practices may have an impact on achieving higher SPiRiT Gold and Platinum ratings.

## RECOMMENDED Improvement Opportunities:

### Establish ACSIM, IMA and USACE Process Evaluation Team to address SDD/SPiRiT Cost and Resource Issues

- The ACSIM, IMA and USACE determine and issue guidance on best method to account for costs associated with achieving higher SPiRiT Gold and Platinum ratings during 1391 process through the first five years of the buildings Operation and Maintenance (total bldg Commissioning).

- Life cycle cost analysis. The current MILCON project programming and approval process inconsistently applies life cycle cost analysis and therefore limits the inclusion of true sustainable features in project designs. Present process is inconsiderate of true Life Cycle benefits of building systems analysis. Most decisions are made on the first cost basis. For example ground source heat pumps included in barracks complex project. Although demonstrated to be life cycle cost effective, installation was instructed to take out of project because Army could not afford it.

- Operation and Maintenance funding "tail" associated with new technologies. Some PDTs excluded SDD feature because the DPW didn't have the capability to maintain. Facilities maintenance procedures and practices adjustments need to be considered when applying sustainable design features. This includes providing training, skilled personnel, and tools.

- Cost Benefit Guidance. Project Teams have little design time available for research on sustainable features and methods. Guidance should be developed for typical sustainable features presenting implementation costs and benefits (objective and subjective) for ease in adoption by project teams.

**Reinforce SDD/SPiRiT policy guidance**

- The IMA issue implementing SDD/SPiRiT guidance that ensures the appropriate DPW staffs participation in the charrette planning and project scoring process. IMA needs to promote the holistic team concept and question project managers that do not establish a project team with all key stakeholders.

- The IMA ensure that Installation Master-Planners and Energy Managers are actively involved in SPiRiT assessments as early as possible in the project concept/definition process. IMA should emphasize the importance of the Master-Planners and Energy Managers incorporating SDD/SPiRiT at the inception of the project and through out the full development of the project. They are vital members of the Project Team and should be fluent in SDD/SPiRiT assessment.

- The IMA and USACE co-conduct an annual SDD/SPiRiT In-Process Review with IMA Regions, DPWs and USACE District/PMs.

- Both the IMA and USACE assist in providing SDD information resources and training for PDTs.

- The IMA provide SDD/SPiRiT guidance to Regions and establish SDD/SPiRiT Points of Contacts at each Region.

- IMA send memo to regions noting the SPiRiT level has been raised to GOAL for FY06 projects and beyond.

- The IMA incorporate SDD/SPiRiT into Operation and Maintenance Projects.

- The ACSIM, IMA, and USACE establish an SDD Working Group chartered to support and further guide the adoption of SDD within the U.S. Army.

- The SDD Working Group evaluate sample of SPiRiT scored projects using the LEED rating scheme for comparison to enhance the SPiRiT process and ease Army's transition to LEED .

- The SDD Working Group expand SDD guidance on use of SPiRiT for non-vertical structure projects.

- The IMA validate SDD aspects of all MILCON projects 1) prior to briefing a project at the Project Review Board, 2) at completion of Concept Design, 3) a 100% Design, and 4) as part of a project's Commissioning.

- The Project Review Board include a single SDD oriented chart for each briefed project. The chart should include project specific SDD features, point factors, and cost impacts (if any).

**Review, update and clarify SPiRiT Criteria/Guidance**

- The ACSIM establish formal recognition for SPiRiT projects achieving SPiRiT Gold or Platinum Ratings.

- The ACSIM, IMA and USACE determine Army's SPiRiT Validation Process for PDT's seeking formal project Gold or Platinum certification (e.g., minimum Documentation requirements).

- The ACSIM continue to incorporate SDD/SPiRiT criteria requirements into the Army's Installation Design Standards efforts.

- The ACSIM and IMA review/change Army's standard design and criteria process and project approval policy/priorities to include specific SDD practices and features (SPiRiT points).

- The USACE develop guidance on requirements for the substantiation/justification of SPiRiT points.

- The USACE issue clarifying guidance on seeking optional bids for enhanced sustainable features and how to score multi-building projects.

- The USACE monitor and document potential differences in SPiRiT points earned based on facility type/Facility Design Team/Facility Category Group/3-digit Category code (e.g. Communication facility vice Barracks).

- The USACE update SPiRiT criteria and guidance to reflect lessons-learned and latest sustainable information compiled since the Army's SPiRiT policy was established in 2001.

- The USACE publish SPiRiT checklist, lessons-learned and reinforcing SDD/SPiRiT guidance to Districts on the Army's SDD web site.

- The USACE provide Districts guidance on how to acquire certain SPiRiT prerequisites based on decisions made by installation master planners, Energy managers and required installation's mission and Army policies. Also, certain state environmental requirements may equal and/or be more stringent than SPiRiT/LEED, therefore, if met, SPiRiT points will be by default, obtained. If so, 'pre-approval' of specific SPiRiT points may be possible for installations, reducing the rating effort. Credits potentially affected include: Erosion, Sedimentation and Water Quality Control, Installation/Base Urban Redevelopment, Reduced Site Disturbance, Storm water Management, and Site Ecology.

- The USACE review and clarify areas of SPiRiT that are difficult for project teams to score as they have inadequate means to quantify/measure results, for example 'quality environment.'

- The USACE expand the SPiRiT scoring spreadsheet from a single point column to include columns for all critical project SPiRiT scoring stages.

## CONCLUSION:

The Army's initial SPiRiT policy required that all projects, starting with the FY 02 MCA program, achieve a minimum SPiRiT Bronze rating. Of the six projects assessed by the validation team, two achieved Gold ratings, two received Silver ratings, and two were validated at the Bronze levels. Considering that the SPiRiT policy was issued late for full sustainable consideration in the planning and design phases of FY02 projects, the Project Delivery Teams did an exemplary job. The validation team feels confident that by applying the improvement opportunities recommended in this

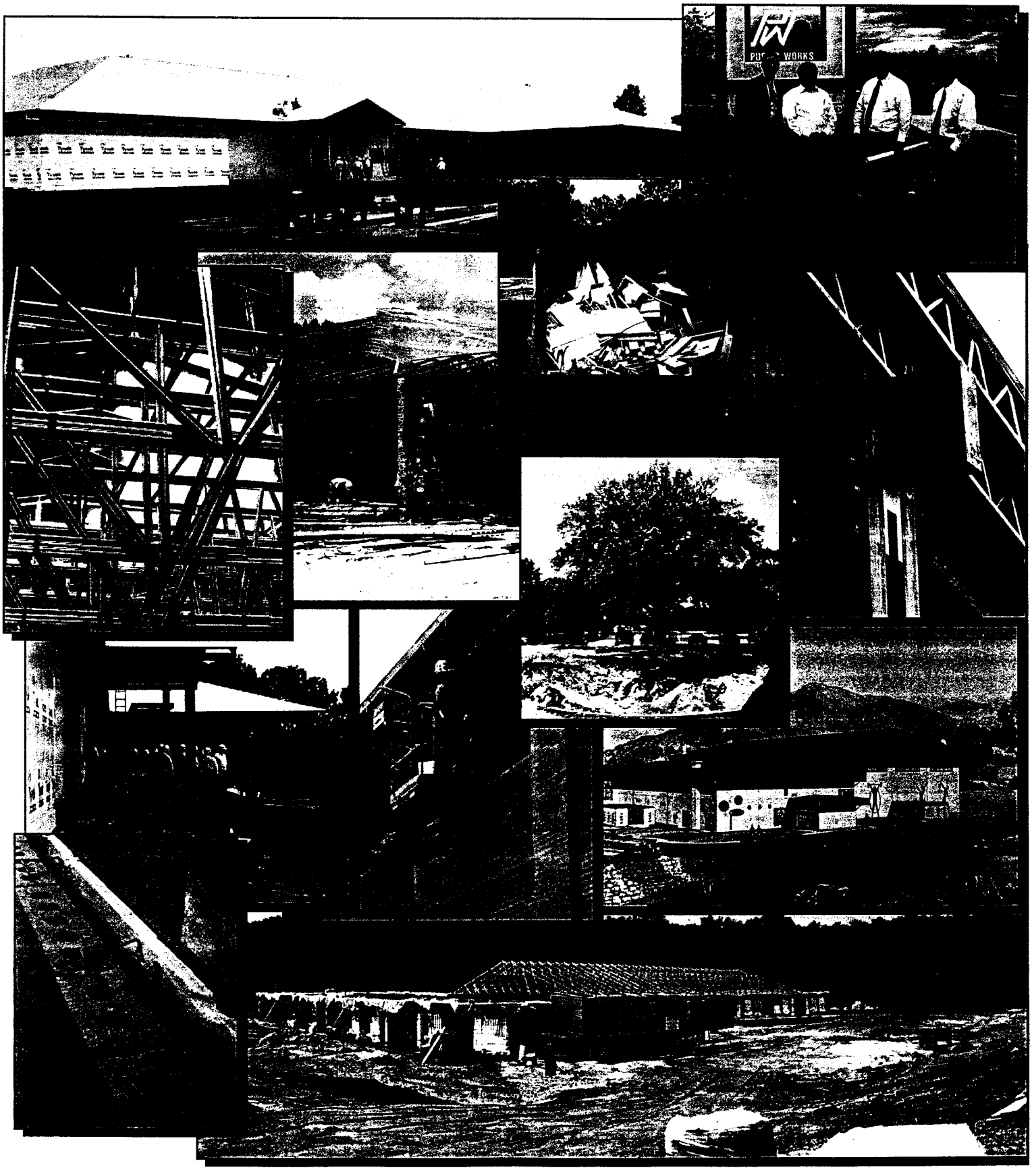
report, future project delivery teams can achieve Silver and low Gold without additional project costs. However, the Army needs to consider its sustainable objectives and strategy for incorporating SDD into the MCA program and execution process, such as providing guidance on capturing additional costs for higher first cost sustainable features and the corresponding life cycle cost savings.

The team believes the Army's SDD/SPiRiT program is far ahead of many Federal agencies. For example the Army has been designating showcase projects annually since FY 02. The Army was first to establish a SPiRiT minimum rating (bronze) in FY 02 and now have raised the bar to Gold starting with FY 06 projects. The Army is also the first service to validate the "sustainability" of their projects.

It should be noted that none of these projects were completed at the time of the Team's validation reviews. The Teams scores are as of the respective project phase of construction observed by the team. When and if these projects come in for their final project SPiRiT certification, the validation teams scores could change.

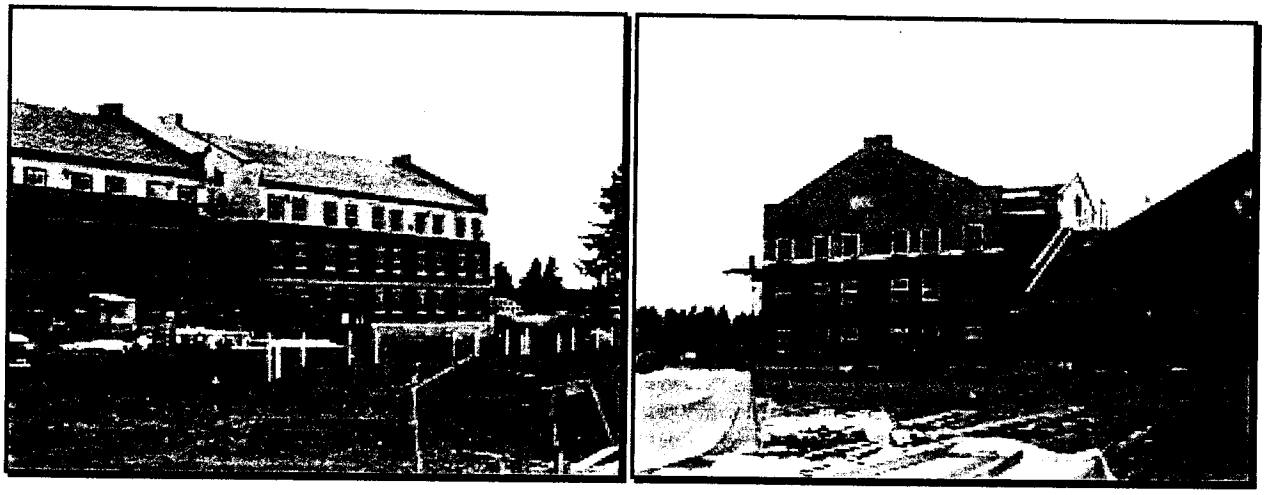
# Project Validations/Site Visits

## Ft. Lewis, Ft. Richardson, Ft. Polk, Ft. Gordon, Ft. Meade, and Camp Carroll (VTC)



# Ft. Lewis, WA, Whole Barracks Renewal, NF Area, Ph 1

Facility Category Code 721 11 (Only Barracks Portion Validated) – Bronze Targeted – USACE/ACSIM Designated FY02 Showcase Project – U. S. Army Engineer District, Seattle, Sustainable Design POC – Michael J. Olinger



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

The Army is requesting full authorization of $150M for this phased complex. Construct a barracks complex and improve installation access security. The project includes barracks, four medium and two large company operations facilities; one battalion headquarters with classroom; and storage facilities. Construct an arterial infrastructure to include two sentry stations and access control facility. Supporting facilities include utilities; electric service; security and street lighting; fire protection and alarm systems; paving, walks, curbs and gutters; fencing and gates; storm and sanitary sewers; oil water separator; information systems; and site improvements. Demolish six buildings (529 m2). Remove pavement (58,800 m2). Anti-terrorism/force protection (AT/FP) measures include laminated glass. Access for the handicapped will be provided. Heating will be provided by self contained gas-fired systems with dual fuel capability. Mechanical ventilation: 800,000 CFM. Supporting facility costs are high due to replacement of streets and associated utilities. Comprehensive interior design is required.

**SPiRiT Self-Assessment Score/Rating by Project Team:** 31 Points/BRONZE
**Validation Team Score/Rating:** 43 Points/Silver
**Reason for Differences:** Conservative SPiRiT criteria interpretation and point scoring.

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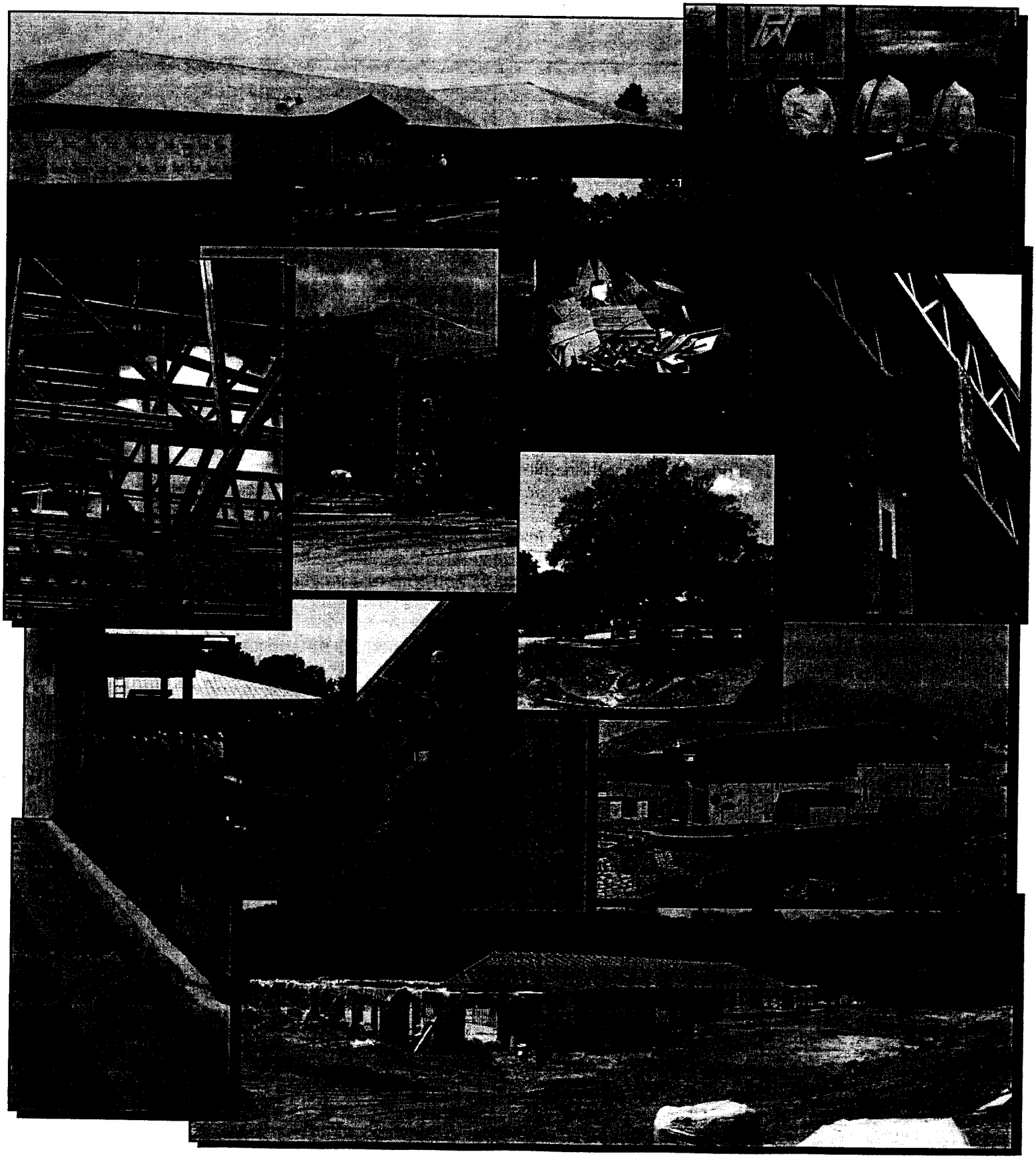

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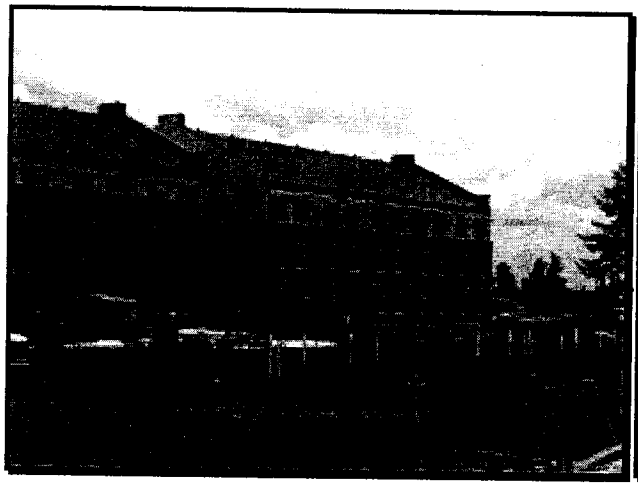

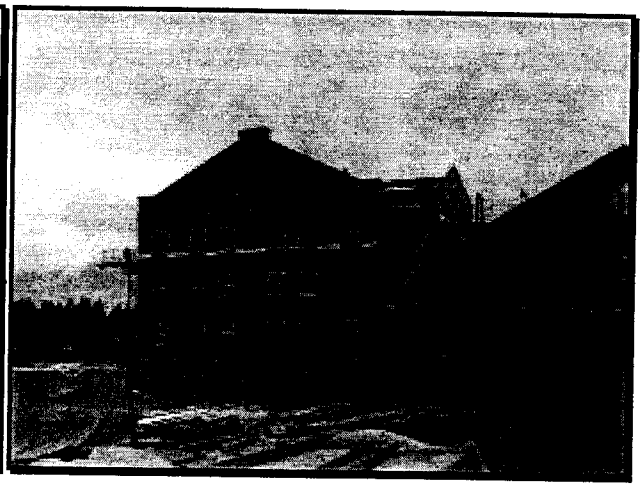

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**SPiRiT Self-Assessment Score/Rating by Project Team:** 31 Points/BRONZE
**Validation Team Score/Rating:** 43 Points/Silver
**Reason for Differences:** Conservative SPiRiT criteria interpretation and point scoring.

**Ft. Lewis Project Team:**

Design Agent – U. S. Army Engineer District, Seattle
Public Works Director – Col Steven Perrenot
Project Manager – MAJ Stephan J. Ward
Master Planner – Steve Glover
Energy Manager – Charles Howell
A/E – USAED Seattle/ WJA
Consultant – Olympic Associates Co. (VE)
Contractor – Baugh-Skanska

**SPiRiT Rating:**

Target Rating – SPiRiT Bronze
Programmatic Design (Planning Charrette/1391) (not applicable)
Parametric (Concept) Design (not applicable)
Final Design – SPiRiT Bronze (41 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Key Project/Building Statistics:**

MCA, FY 02, Project Number 041746
Design Bid Build
Projected Completion Dec 2003
$43 Mil (PA) $37.6 Mil (CWE)
Facility Area ~15,000 Square Meters (Barracks, 1 BTN HQ, 2 MCOF, 1 LCOF) (Barracks 11,180 SM)
Facility Footprint ~ 6,200 Square Meters (Barracks 4,100 SM)
300 Person Barracks Occupancy
Construction Type (Type IIB with Steel Frame, Brick Veneer & EIFS Walls, Concrete Tile Roofs)
31% Energy Use Reduction (Barracks)

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites

- Constructed Storm Water Management System
- Low Impact Highly Functional Site Selection
- Compatible Redevelopment Previous Barracks Site
- Increased Density Within Existing Infrastructure
- Alternative Transportation – Cycling
- Facilities Clustered for Future Mass Transit

Energy and Atmosphere

- Installation has Green Energy Contract
- 31% Energy Use Reduction for Barracks

Materials and Resources

- Recycled Content Structure and Materials
- 20% of Materials are Local/Regional

Indoor Environmental Quality (IEQ)

- Separate Ventilation System for Smoking Rooms
- Mechanical Ventilation to ASHRAE Standards
- Low Emitting Adhesives, Sealants, Paints and Wood Composites
- Design to Control Indoor Chemicals and Pollutants
- Individual Room HVAC Control
- Thermal Comfort to ASHRAE Standards
- Daylighting of Barracks Rooms
- Acoustic Isolation for Occupant Comfort

Facility Delivery Process
- Team Selected and Trained in Holistic/Sustainable Design
- Goals & Metrics Established During Project Charrettes
- SPiRiT Scoring Throughout Project

Current Mission
- High Quality Indoor Environment for Quality of Life
- Furnishing & Finishes Selected for Life-Cycle Durability & Maintenance Ease
- Safe, Healthy, & Functional Work/Living Environment

Future Missions
- Longevity of Materials & Systems Considered
- No usage change expected

SPiRiT Validation

| Ft. Lewis - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** | **Score 20** | **6** | **6** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 1 | 1 |
| 1.C5 | Reduced Site Disturbance | 2 | 0 | 0 |
| 1.C6 | Stormwater Management | 2 | 0 | 0 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 0 | 0 |
| 1.C8 | Light Pollution Reduction | 1 | 0 | 0 |
| 1.C9 | Optimize Site Features | 1 | 0 | 0 |
| 1.C10 | Facility Impact | 2 | 1 | 1 |
| 1.C11 | Site Ecology | 1 | 0 | 0 |
| **2.0** | **Water Efficiency** | **Score 5** | **0** | **0** |
| 2.C1 | Water Efficient Landscaping | 2 | 0 | 0 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 0 |
| **3.0** | **Energy and Atmosphere** | **Score 28** | **12** | **13** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 12 | 12 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 0 | 0 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 0 | 0 |
| 3.C6 | Green Power | 1 | 0 | 1 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** | **Score 13** | **1** | **3** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 0 | 0 |
| 4.C3 | Resource Reuse | 2 | 0 | 0 |
| 4.C4 | Recycled Content | 2 | 0 | 2 |
| 4.C5 | Local/Regional Materials | 2 | 1 | 1 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 0 | 0 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** | **Score 17** | **2** | **9** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 0 | 0 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 0 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 0 | 0 |
| 5.C4 | Low-Emitting Materials | 4 | 0 | 4 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 0 | 1 |
| 5.C6 | Controllability of Systems | 2 | 0 | 0 |
| 5.C7 | Thermal Comfort | 2 | 0 | 1 |
| 5.C8 | Daylight and Views | 2 | 1 | 1 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 0 | 0 |
| **6.0** | **Facility Delivery Process** | **Score 7** | **3** | **4** |
| 6.C1 | Holistic Delivery of Facility | 7 | 3 | 4 |
| **7.0** | **Current Mission** | **Score 6** | **3** | **4** |
| 7.C1 | Operation and Maintenance | 3 | 1 | 1 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 2 | 3 |
| **8.0** | **Future Missions** | **Score 4** | **4** | **4** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 2 | 2 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 2 | 2 |
| | **Total Score** | **100** | **31** | **43** |

| SPiRiT Sustainable Project Certification Levels | |
|---|---|
| SPiRiT Bronze | 25-34 |
| SPiRiT Silver | 35-49 |
| SPiRiT Gold | 50-74 |
| SPiRiT Platinum | 75-100 |

**SPiRiT Project Process:**

- Had Leadership Commitment (District Commander; Installation and Garrison Commander; DPW) and keep them informed/engaged (Yes)
- Established SDD Trained/Focused Project Team @ Project Concept/planning phase (No/Full Team 1st met @ 30% design phase)
- Integrated Project Team representatives included District Project Manager; A-E (Bid-Build Contractor); DPW (Master Planner; Energy and Environmental Mgrs) (YES)
- SDD/SPiRiT Team Training (NO/DPW plans to provide LEED training for future projects)
- Conducted Sustainable Planning & Design Charrettes (No/Plans to on future projects)
- Set SPiRiT Goals @ Project concept/planning phase (Yes/Bronze rating set @ initial SPiRiT assessment conducted by District PM. Became a SPiRiT showcase mid way through design)
- SPiRiT Scoring Spreadsheet UPDATE were made and being tracked starting with Initial SPiRiT Goal/score and project updates thru BOD) (Yes)
- Documented SPiRiT assessment and scoring/points Results (Yes)
- Project costs w/in PA (Yes)
- Design-Bid-Build (Combination of District in-house design (barracks) and AE (other facilities)

**Findings/What's Working:**

- Seattle District was very conservative in the interpretation of SPiRiT points.
- Ft. Lewis stakeholders were not active participants in the sustainable design or SPiRiT scoring process since the sustainable design policy was issued and the project became a SPiRiT showcase midway through design. As a result, the Ft. Lewis project was not truly 'holistic.'
- Although the end design provided a high quality interior environment, Seattle District did not claim points for 7.C2 since they felt they had no adequate means to quantify/measure 'quality environment' for the purpose of SPiRiT.
- The Ft. Lewis Project Team indicated that one of the biggest barriers to successful sustainable design was cost data and analysis.
- Seattle District claimed no points for 'Green Power,' however, Ft. Lewis indicated that they had contracted for green power that would meet this projects requirements as a minimum. Had Ft. Lewis stakeholders been members of the Project Team, this would have been obvious early on.
- Technologies and solutions for green design were deleted from consideration because the Ft. Lewis Public Works Business Center could not support the new/increased maintenance requirements, e.g. systems were too complex, maintenance training was needed, required skills were not available, and/or more manpower was required.
- Ft. Lewis is in an environmental non-attainment zone and therefore project emission reductions are critical to installation mission requirements.
- The project was executed by a combination of Seattle District in-house design (Barracks) and AE (Medium and Large Company Operations Facilities; Battalion Headquarters with Classroom; and Storage Facilities). The AE portion of the project was not rated since the AE contract was already underway.
- Seattle District conservatively rated the whole project, on the basis of the lowest level achieved, e.g. if any element of the project did not warrant a point, the whole project did not claim the point.
- Seattle District indicated that the barracks portions of the project if considered alone, were capable of a 31% energy reduction and therefore eligible for an additional 12 points for 'optimize energy performance.
- Seattle District conservatively eliminated from consideration any sustainable design feature if they felt selection would increase the cost above the PA; ex. The costs of Low VOC was an

unknown, and/or an incremental increase, which might exceed the PA, and therefore was excluded.

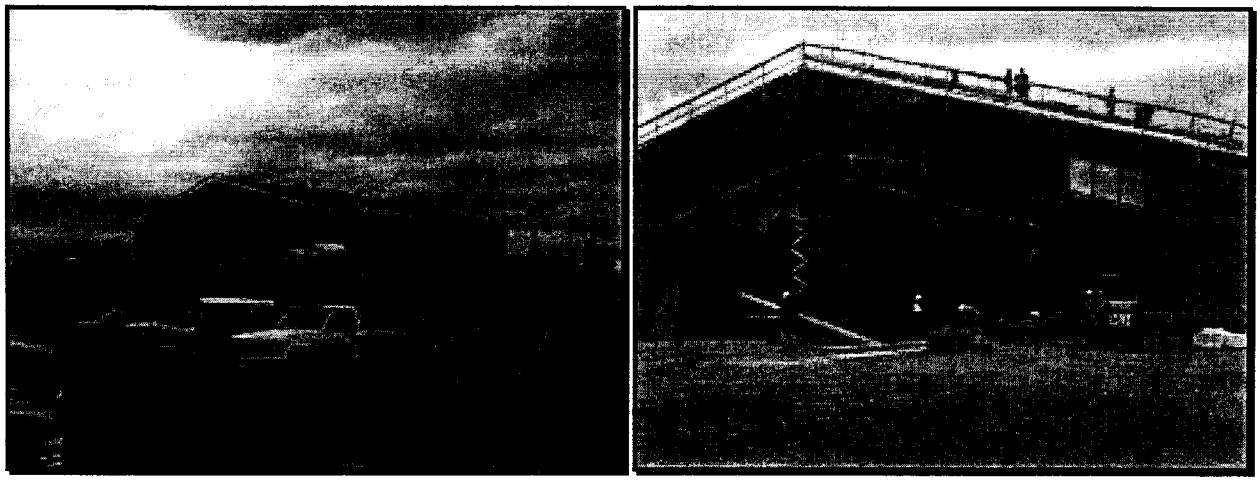
- Ft. Lewis and Seattle District considered registering this project with the US Green Building Council and seeking LEED certification.
- Seattle District carefully evaluated construction costs to achieve SPiRiT points in making design decisions to keep within the PA.
- Sustainable design development, in that it requires new technologies, practices, materials, etc., requires additional design time/fees during the learning process.

**Improvement Opportunities/Lessons Learned:**

- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 1.C5 Reduced Site Disturbance; 4.C2 Construction Waste Management; 4.C7 Certified Wood; 6.C1 Holistic Delivery of Facility; and 7.C1 Operation and Maintenance.

# Ft. Richardson, AK, Barracks Complex – D Street, Phase 2

Facility Category Code 721 11 (Only Barracks Portion Validated) – Barracks, Dining Facility; & Company Operations Facilities [Whole Barracks Renewal – Bronze Targeted – USACE/ACSIM Designated FY02 Showcase Project – U. S. Army Engineer District, Alaska District, Sustainable Design POC - Alexander I. Anyaegbunam



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

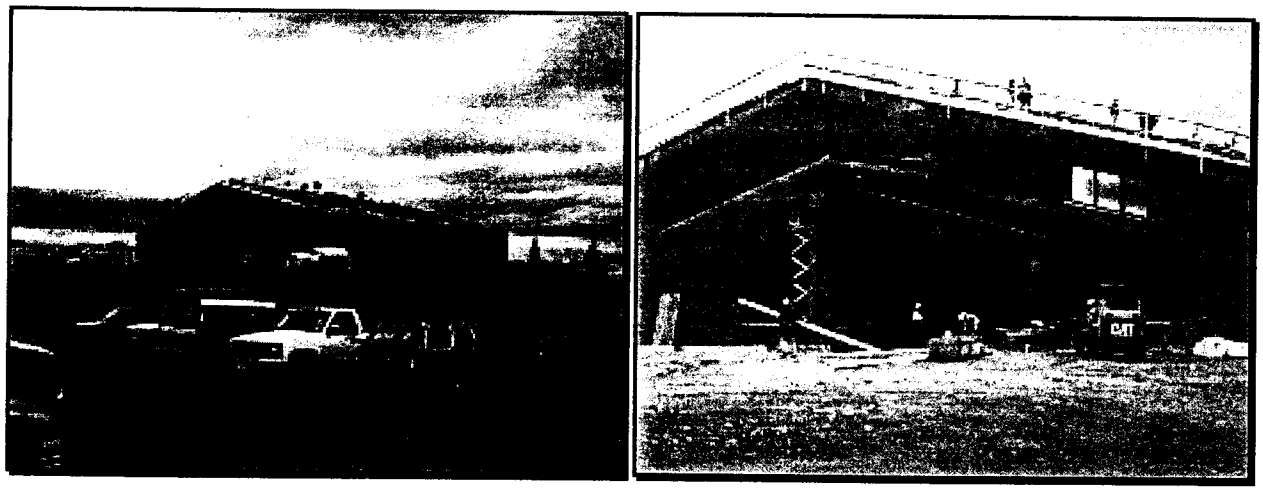
The Army is requesting full authorization of $97 million for this phased project. The Army's plan is to construct all phases of this complex under one contract. This phase will construct one barracks building; one dining facility; three large sized company operations facilities; and five medium sized company operations facilities. Connect energy monitoring and control systems (EMCS) in all facilities. Supporting facilities include building information system, fire suppression system, exterior lighting; paving; parking areas; recreational areas; walks; curbs; gutters; erosion control measures and site improvements. Relocation and extension of water distribution; sanitary and storm water sewerage. Provide asbestos cleanup. Access for the handicapped will be provided. Anti-terrorism/force protection (AT/FP) include structural reinforcements, thermal treated glazing and bollards. Comprehensive interior design is required. The supporting facility cost is high due to demolition and high utility construction costs at Fort Richardson. Heat will be supplied by individual gas-fired building heating plants. Demolish five buildings (260,969 SF).

**SPiRiT Self-Assessment Score/Rating by Project Team:** 25 Points/BRONZE
**Validation Team Score/Rating:** 26 Points/BRONZE
**Reason for Differences:**

- Alaska District was liberal in scoring, however, appears to have 'stopped' when the bronze minimum of 25 points was reached, both in scoring and attempting a higher rating;
- SPiRiT scoring prepared after design completion prior to assessment team's visit;
- Fort Richardson DPW Staff did not participate in the SPiRiT process and had little knowledge of SDD; Concurred with SPiRiT Score after the fact.

# Ft. Richardson, AK, Barracks Complex – D Street, Phase 2

Facility Category Code 721 11 (Only Barracks Portion Validated) – Barracks, Dining Facility; & Company Operations Facilities [Whole Barracks Renewal – Bronze Targeted – USACE/ACSIM Designated FY02 Showcase Project – U. S. Army Engineer District, Alaska District, Sustainable Design POC - Alexander I. Anyaegbunam



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

The Army is requesting full authorization of $97 million for this phased project. The Army's plan is to construct all phases of this complex under one contract. This phase will construct one barracks building; one dining facility; three large sized company operations facilities; and five medium sized company operations facilities. Connect energy monitoring and control systems (EMCS) in all facilities. Supporting facilities include building information system, fire suppression system, exterior lighting; paving; parking areas; recreational areas; walks; curbs; gutters; erosion control measures and site improvements. Relocation and extension of water distribution; sanitary and storm water sewerage. Provide asbestos cleanup. Access for the handicapped will be provided. Anti-terrorism/force protection (AT/FP) include structural reinforcements, thermal treated glazing and bollards. Comprehensive interior design is required. The supporting facility cost is high due to demolition and high utility construction costs at Fort Richardson. Heat will be supplied by individual gas-fired building heating plants. Demolish five buildings (260,969 SF).

**SPiRiT Self-Assessment Score/Rating by Project Team:** 25 Points/BRONZE
**Validation Team Score/Rating:** 26 Points/BRONZE
**Reason for Differences:**

- Alaska District was liberal in scoring, however, appears to have 'stopped' when the bronze minimum of 25 points was reached, both in scoring and attempting a higher rating;
- SPiRiT scoring prepared after design completion prior to assessment team's visit;
- Fort Richardson DPW Staff did not participate in the SPiRiT process and had little knowledge of SDD; Concurred with SPiRiT Score after the fact.

**Ft. Richardson Project Team:**

Design Agent – U. S. Army Engineer District, Alaska
Public Works Director – COL Dave Snodgrass
Project Manager – Mr. Chris R. Dalsfoist, POA
Master Planner – George Newman
AE – Alaska District In-House Design with Koonce Pffefer Bettis
Consultant – Clevenger and Associates
Contractor – Osborne Construction Company

**SPiRiT Rating:**

Target Rating – SPiRiT Bronze
Programmatic Design (Planning Charrette/1391) (not applicable)
Parametric (Concept) Design (not applicable)
Final Design – SPiRiT Bronze (25 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Key Project/Building Statistics:**

Dining Facility
FY02 MCA Program, Project Number 052830
Design Bid Build
Projected Completion 15 Dec 2003
Costs: $45 Mil (PA) $39.187 Mil (CWE)
(Dining) Facility 2117 Square Meters
(Dining) Facility Footprint 2117 Square Meters
251-500 Person Occupancy
Construction Type (Steel Frame, Masonry Enclosure, Standing Seam Metal Roof)
10% Energy Use Reduction

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites
- Constructed Storm Water Management System
- Low Impact Highly Functional Site Selection
- Access to Installation Transportation
- Site Enhancements

Materials and Resources
- Recycled Content Structure

Indoor Environmental Quality (IEQ)
- Mechanical Ventilation to ASHRAE Standards
- Green Seal Paints and Coatings
- Design to Control Indoor Chemicals and Pollutants
- Occupant Temperature & Lighting Controls
- Operable Windows
- Thermal Comfort to ASHRAE Standards
- Daylight & Direct Views Provisions in all Normally Occupied Spaces
- Acoustic Isolation for Occupant Comfort

Current Mission
- Furnishing & Finishes Selected for Life-Cycle Durability & Maintenance Ease
- Safe, Healthy, & Functional Work/Living Environment
- Quality of Life Improvements

SPiRiT Validation

| Ft. Richardson - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** | **Score 20** | **10** | **10** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 3 | 3 |
| 1.C5 | Reduced Site Disturbance | 2 | 0 | 0 |
| 1.C6 | Stormwater Management | 2 | 0 | 0 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 0 | 0 |
| 1.C8 | Light Pollution Reduction | 1 | 0 | 0 |
| 1.C9 | Optimize Site Features | 1 | 0 | 0 |
| 1.C10 | Facility Impact | 2 | 2 | 2 |
| 1.C11 | Site Ecology | 1 | 1 | 1 |
| **2.0** | **Water Efficiency** | **Score 5** | **0** | **0** |
| 2.C1 | Water Efficient Landscaping | 2 | 0 | 0 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 0 |
| **3.0** | **Energy and Atmosphere** | **Score 28** | **0** | **4** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 0 | 4 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 0 | 0 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 0 | 0 |
| 3.C6 | Green Power | 1 | 0 | 0 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** | **Score 13** | **0** | **1** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 0 | 0 |
| 4.C3 | Resource Reuse | 2 | 0 | 0 |
| 4.C4 | Recycled Content | 2 | 0 | 1 |
| 4.C5 | Local/Regional Materials | 2 | 0 | 0 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 0 | 0 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** | **Score 17** | **5** | **7** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 0 | 0 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 0 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 0 | 0 |
| 5.C4 | Low-Emitting Materials | 4 | 1 | 0 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 0 | 1 |
| 5.C6 | Controllability of Systems | 2 | 1 | 1 |
| 5.C7 | Thermal Comfort | 2 | 0 | 1 |
| 5.C8 | Daylight and Views | 2 | 2 | 2 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 0 | 0 |
| **6.0** | **Facility Delivery Process** | **Score 7** | **7** | **0** |
| 6.C1 | Holistic Delivery of Facility | 7 | 7 | 0 |
| **7.0** | **Current Mission** | **Score 6** | **3** | **4** |
| 7.C1 | Operation and Maintenance | 3 | 0 | 1 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 3 | 3 |
| **8.0** | **Future Missions** | **Score 4** | **0** | **0** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 0 | 0 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 0 | 0 |
| | **Total Score** | **100** | **25** | **26** |

| SPiRiT Sustainable Project Certification Levels | |
|---|---|
| SPiRiT Bronze | 25-34 |
| SPiRiT Silver | 35-49 |
| SPiRiT Gold | 50-74 |
| SPiRiT Platinum | 75-100 |

**SPiRiT Project Process:**

- Had Leadership Commitment (District Commander; Installation and Garrison Commander; DPW) and keep them informed/engaged (No)
- Established SDD Trained/Focused Project Team @ Project Concept/planning phase (No evidence of holistic design process)
- Integrated Project Team representatives included District Project Manager; A-E (Bid-Build Contractor); DPW (Master Planner; Energy and Environmental Mgrs) (Yes)
- SDD/SPiRiT Team Training (No)
- Conducted Sustainable Planning & Design Charrettes (Yes/ Held 2 & ½ day planning charrette – develop 1391) and 1 week value-based design charrette)
- Set SPiRiT Goals @ Project concept/planning phase (No/SPiRiT rating of project done by Alaska District, after design complete. Rating not part of the design process and not as a project Team effort/activity; no rating consensus, but customer concurred after the fact)
- SPiRiT Scoring Spreadsheet UPDATE were made and being tracked starting with Initial SPiRiT Goal/score and project updates thru BOD) (No/Started with announcement of validation team's visit)
- Documented SPiRiT assessment and scoring/points results (No)
- Project costs w/in PA (Yes)
- Design-Bid-Build
- Alaska District has other projects in FY03-05 showcase program. No information was provided. List as minimum the ACSIM/USACE Designated Showcase Projects.

**Findings/What's Working:**

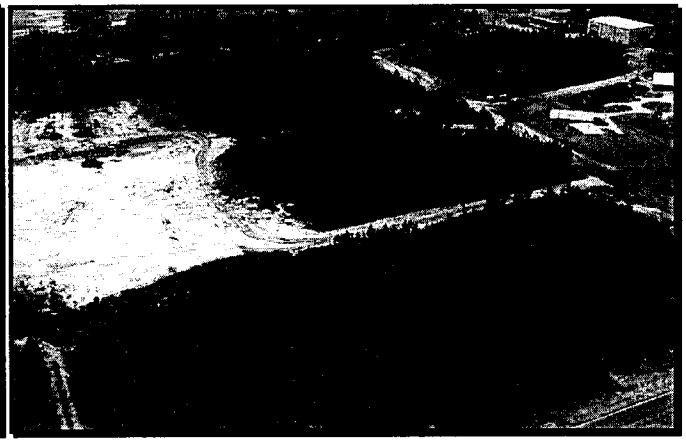
- Ft. Richardson stakeholders were not active participants in the sustainable design or SPiRiT scoring process since the sustainable design policy was issued and the project became a SPiRiT showcase midway through design. As a result, the Ft. Richardson project was not truly 'holistic.'
- It is standard practice to use charrettes during the value engineering (VE) of projects and to track 'VE' progress via spreadsheet at Alaska District. They are familiar with and very capable, therefore, of using charrettes and spreadsheet tracking for holistic design. They did not, however, use these techniques on this project. [https://www.poa.usace.army.mil/en/ve/index.htm]
- A baseline SPiRiT 'evaluation' was done by Alaska District prior to design charrette, but design was not accomplished with sustainability in mind, tracked over the course of the effort and no rating of project was one until design was complete.
- In general Alaska District was liberal in interpretation of requirements and scores, however, they seem to have 'stopped' when they reached the minimum 25 points to reach the required bronze rating, both in scoring and attempting to achieve more points.
- The Alaska District SDD POC had limited project involvement. There is no project funding to support this involvement, and therefore, all SDD expertise has to be with members of the project team.

**Improvement Opportunities/Lessons Learned:**

- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 1.C5 Reduced Site Disturbance; 1.C6 Stormwater Management; 2.C1 Water Efficient Landscaping; 4.C2 Construction Waste Management; 1 4.C4 Recycled Content; 4.C7 Certified Wood; and 2 7.C1 Operation and Maintenance.

# Ft. Polk, LA, Consolidated Library/General Education Center

Facility Category Code 740 25 – Bronze Targeted – USACE/ACSIM Designated FY02
Showcase Project – U. S. Army Engineer District, Ft. Worth, Sustainable Design
POC - Jimmy D. Baggett



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

Construct a consolidated main post library and general education center complex with access road. Supporting facilities include utilities; electric service; exterior lighting; fire protection and alarms systems; paving, walks, curbs and gutters; parking; storm drainage; and site improvements. Heating and air conditioning (182 tons) will be provided by self-contained system. Access for handicapped will be provided. The high support facilities costs are due to construction in an area requiring off-site utilities and site improvements, erosion control, and storm drainage. Anti-Terrorism/Force Protection (AT/FP) measures will include laminated glass and traffic control barriers. A comprehensive interior design package is to be included as part of the design for this project.

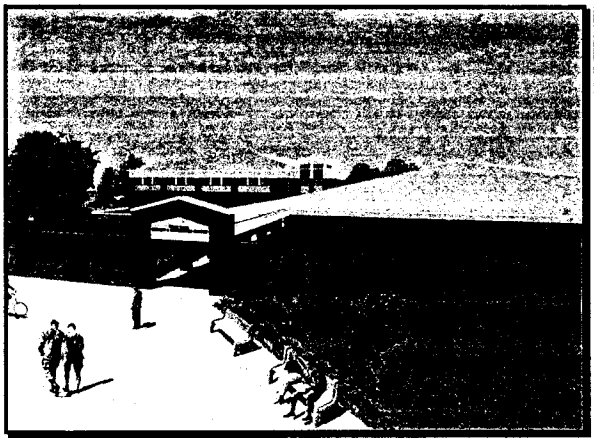
**SPiRiT Self-Assessment Score/Rating by Project Team:** 50 Points/Gold
**Validation Team Score/Rating:** 55 Points/GOLD
**Reason for Differences:** Conservative SPiRiT criteria interpretation and point scoring

**Ft. Polk Project Team:**
Design Agent – U. S. Army Engineer District, Ft. Worth
Public Works Director – Roy Bethel
Project Manager – Steve Wright
Master Planner – David Broyles
Design/Build Contractor Team – Roy Anderson Corporation

**SPiRiT Rating:**
Target Rating – SPiRiT Bronze
Programmatic Design (Planning Charrette/1391) SPiRiT Silver (47 Points)
Parametric (Concept) Design (not applicable)
Final Design – SPiRiT Gold (50 Points)
Beneficial Occupancy Date (BOD)– (TBD)

# Ft. Polk, LA, Consolidated Library/General Education Center

Facility Category Code 740 25 – Bronze Targeted – USACE/ACSIM Designated FY02
Showcase Project – U. S. Army Engineer District, Ft. Worth, Sustainable Design
POC - Jimmy D. Baggett



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**SPiRiT Self-Assessment Score/Rating by Project Team:** 50 Points/Gold
**Validation Team Score/Rating:** 55 Points/GOLD
**Reason for Differences:** Conservative SPiRiT criteria interpretation and point scoring

**Ft. Polk Project Team:**
Design Agent – U. S. Army Engineer District, Ft. Worth
Public Works Director – Roy Bethel
Project Manager – Steve Wright
Master Planner – David Broyles
Design/Build Contractor Team – Roy Anderson Corporation

**SPiRiT Rating:**
Target Rating – SPiRiT Bronze
Programmatic Design (Planning Charrette/1391) SPiRiT Silver (47 Points)
Parametric (Concept) Design (not applicable)
Final Design – SPiRiT Gold (50 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Key Project/Building Statistics:**

FY02 MCA Program, Project Number 002298
Design Build
31 Jan 2004 Projected Completion Date
Costs $10.8 Mil (PA) and $10.785 Mil (CWE)
Facility Area 6,900 Square Meters
Facility Footprint 4,200 Square Meters
740 Person Occupancy
Construction Type (Steel Frame, Masonry Enclosure, Standing Seam Metal Roof)
10% Energy Use Reduction

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites
- Approved Erosion & Sediment Control Plan
- Low Impact Highly Functional Site Selection
- Located on Installation Transit Line
- Parking Sized /Located for Sharing with Adjacent Future Facilities
- Restored Site Open Areas & Reduced Footprint
- No net Run-Off Increase Through Stormwater Management
- Vegetative Shading of Parking Surfaces
- EnergyStar Eligible Standing Seam Metal Roof

Water Efficiency
- Highly Efficient Irrigation

Energy and Atmosphere
- Additional Commissioning

Materials and Resources
- Construction Waste Management
- Recycled Content Materials
- Local Materials

Indoor Environmental Quality (IEQ)
- $CO^2$ Sensor control over Fresh Air Mix
- VAV Distributed Make-Up Air
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Humidity Control and Monitoring
- Environmental Noise Mitigation

Facility Delivery Process
- Team Selected & Trained in Holistic/Sustainable Design
- Key Team Members LEED Accredited
- Goals & Metrics Established During Project Charrettes

Current Mission
- Operation & Maintenance Manuals
- Furnishing & Finishes Selected for Life-Cycle Durability & Maintenance Ease
- Safe, Healthy, & Functional Work/Living Environment

Future Missions
- Longevity of Materials & Systems Considered

SPiRiT Validation

| Ft. Polk - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** Score | **20** | **14** | **16** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 2 | 2 |
| 1.C5 | Reduced Site Disturbance | 2 | 2 | 2 |
| 1.C6 | Stormwater Management | 2 | 0 | 1 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 1 | 2 |
| 1.C8 | Light Pollution Reduction | 1 | 1 | 1 |
| 1.C9 | Optimize Site Features | 1 | 1 | 1 |
| 1.C10 | Facility Impact | 2 | 2 | 2 |
| 1.C11 | Site Ecology | 1 | 1 | 1 |
| **2.0** | **Water Efficiency** Score | **5** | **1** | **1** |
| 2.C1 | Water Efficient Landscaping | 2 | 1 | 1 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 0 |
| **3.0** | **Energy and Atmosphere** Score | **28** | **1** | **5** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 0 | 4 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 1 | 1 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 0 | 0 |
| 3.C6 | Green Power | 1 | 0 | 0 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** Score | **13** | **4** | **4** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 2 | 2 |
| 4.C3 | Resource Reuse | 2 | 0 | 0 |
| 4.C4 | Recycled Content | 2 | 1 | 1 |
| 4.C5 | Local/Regional Materials | 2 | 1 | 1 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 0 | 0 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** Score | **17** | **13** | **13** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 1 | 1 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 1 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 2 | 2 |
| 5.C4 | Low-Emitting Materials | 4 | 4 | 4 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 1 | 1 |
| 5.C6 | Controllability of Systems | 2 | 0 | 0 |
| 5.C7 | Thermal Comfort | 2 | 2 | 2 |
| 5.C8 | Daylight and Views | 2 | 0 | 0 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 1 | 1 |
| **6.0** | **Facility Delivery Process** Score | **7** | **7** | **7** |
| 6.C1 | Holistic Delivery of Facility | 7 | 7 | 7 |
| **7.0** | **Current Mission** Score | **6** | **6** | **6** |
| 7.C1 | Operation and Maintenance | 3 | 3 | 3 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 3 | 3 |
| **8.0** | **Future Missions** Score | **4** | **4** | **3** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 2 | 2 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 2 | 1 |
| | **Total Score** | **100** | **50** | **55** |

| SPiRiT Sustainable Project Certification Levels | |
|---|---|
| SPiRiT Bronze | 25-34 |
| SPiRiT Silver | 35-49 |
| SPiRiT Gold | 50-74 |
| SPiRiT Platinum | 75-100 |

**SPiRiT Project Process:**

- Had Leadership Commitment (District Commander; Installation and Garrison Commander; DPW) and keep them informed/engaged (Yes)
- Established SDD Trained/Focused Project Team @ Project Concept/planning phase (Qualified No/Full team 1st met @ proposal evaluation. Note: This project was congressional add to FY 02 MCA program, therefore, they MAY have been unable to respond appropriately due to shortened timeline)
- Integrated Project Team representatives included District Project Manager; A-E (Design-Build Contractor); DPW (Master Planner; Energy and Environmental Mgrs) (Yes)
- SDD/SPiRiT Team Training (No)
- Conducted Sustainable Planning & Design Charrettes (Qualified No/FY02 congressional add on. Fast track project)
- Set SPiRiT Goals @ Project concept/planning phase (Yes/Minimum Silver @ RFP)
- SPiRiT Scoring Spreadsheet UPDATE were made and being tracked starting with Initial SPiRiT Goal/score and project updates thru BOD) (Yes/SPiRiT reviews @ 60% and 100% design & 30% Construction)
- Documented SPiRiT assessment and scoring/points Results (Yes)
- Project costs w/in PA (Yes)
- Design-Build

**Findings/What's Working:**

- There was ample evidence of a commitment to sustainable design and development and SPiRiT in the Design/Build Contractor Team. The need and commitment were obviously communicated to the winning contractor during the course of the procurement process to the benefit of the overall effort.
- The Design/Build Request for Proposal (RFP) was prepared in-house at Ft. Worth District. It took them six months to develop a two-step solicitation. The process utilized reduced initial proposals to short-list of acceptable firms with final selection based on 'best value' allowing flexibility to select a firm and concept solution best fitting the needs of sustainable design.
- The RFP was limited to functional layouts only (bubble diagrams of functional relationships as opposed to concept designs with floor plans) to allow maximum opportunity for successful bidders to optimize the design solution to meet program requirements.
- The RFP specified key minimum SPiRiT points required, and the level of SPiRiT to be achieved. Further, it required the Design/Build Contractor to document (and certify) their achievement. In this manner, the project team could be assured that sustainable design features for their project/installation, could be achieved.
- To successfully obtain a sustainable project in Design/Build process, sustainability goals must be clearly indicated in the RFP and proposals must be carefully reviewed, none of which are possible without an effective project team, both prior to and during the design construction process.
- Ft. Worth District considered but did not include contract options for sustainable design features to be exercised if the bids came in under the PA.
- Ft. Worth District considered and rejected claiming 1.C3 Brownfields points, given previous site uses. For this project, Brownfields points are inappropriate. Although 'contaminated by a previous use,' the site was neither 'contaminated' to a level, which would qualify it as 'EPA Brownfield', nor was it selected specifically for clean-up through development.
- Under this project, functions were consolidated in single facility; classrooms space optimized by sharing facilities across functions/customers, and parking shared with future adjacent facilities (family readiness center) . While this limited the overall project/parking footprint garnering some

SPiRiT points, this project represents sound master planning to reduce overall installation facilities footprints/development.

- The AE member of the Design/Build Contractor Team commented that a holistic approach was key to success in sustainable design, and essential to optimize sustainability.
- The standing seam metal roof selected for this project is highly reflective, but since it has not been tested for/certified as EnergyStar compliant, no points have been claimed. The validation team allowed credit for this point, given the high probability the roof was compliant.

**Improvement Opportunities/Lessons Learned:**

- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 1.C4 Alternative Transportation (Showers); 2.C3 Water Use Reduction; and 4.C7 Certified Wood

# Ft. Gordon, GA, Installation Communications Facility

Facility Category Code 131 15 – Bronze Targeted – USACE/ACSIM Designated FY02
Showcase Project – U. S. Army Engineer District, Savannah, Sustainable Design
POC - Judith F. Milton

10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

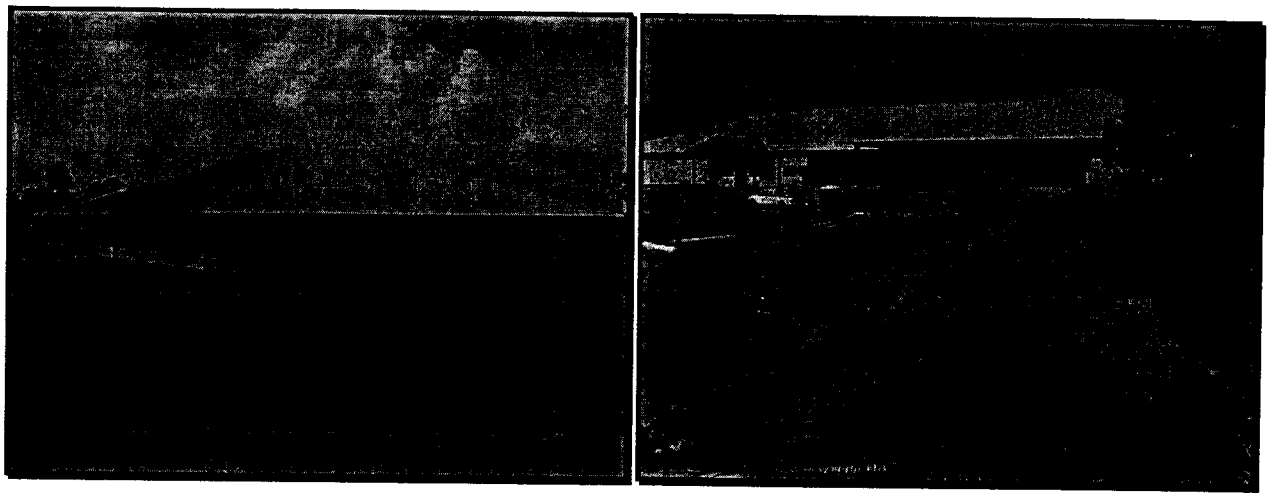
Construct a standard-design information systems facility to include functional space for switchgear, relocate switch/uninterrupted power supply (UPS)and associated equipment, communications operations, Information Management administrative areas, controlled humidity part storage and repair areas, 24-hour operator/information operations, logistical support, and records management. Install intrusion detection system (IDS). Provide central monitoring and control capability, fully compatible with the existing installation Direct Digital Control energy monitoring and control system (EMCS). Anti-terrorism and Force Protection measures will include laminated glass and traffic control barriers. Supporting facilities include partial upgrade to water, sewer, electrical, and gas; fire protection and alarm systems; paving, walks, curbs and gutters; storm drainage; information systems; and site improvements. Access for the handicapped will be provided. Heating (gas-fired)will be provided by stand-alone systems. Air conditioning: 200 tons. Perform asbestos abatement and demolish ten buildings (1725 sq. meters). Comprehensive interior design services are required.

**SPiRiT Self-assessment score/Rating by Project Team:** 68 Points/GOLD
**Validation Team Score/Rating:** 70 Points/GOLD
**Reason for Differences:** Interpretation of SPiRiT requirements

**Ft. Gordon Project Team:**
Design Agent – U. S. Army Engineer District, Savannah
Public Works Director – Vincent E. Grewatz
Project Manager – Efrain Rosario
Master Planner – Carlton Shuford
Design/Build Contractor Team – TENG Construction LLC
Facility Owner – Directorate of Information Management

# Ft. Gordon, GA, Installation Communications Facility

Facility Category Code 131 15 – Bronze Targeted – USACE/ACSIM Designated FY02
Showcase Project – U. S. Army Engineer District, Savannah, Sustainable Design
POC - Judith F. Milton



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**SPiRiT Self-assessment score/Rating by Project Team:** 68 Points/GOLD
**Validation Team Score/Rating:** 70 Points/GOLD
**Reason for Differences:** Interpretation of SPiRiT requirements

**Ft. Gordon Project Team:**
Design Agent – U. S. Army Engineer District, Savannah
Public Works Director – Vincent E. Grewatz
Project Manager – Efrain Rosario
Master Planner – Carlton Shuford
Design/Build Contractor Team – TENG Construction LLC
Facility Owner – Directorate of Information Management

**SPiRiT Rating:**

Target rating – SPiRiT Bronze/LEED Gold (39 Points) *PDT Considering LEED Registration.
Programmatic Design (Planning Charrette/1391) (not applicable)
Parametric (Concept) Design -- SPiRiT Gold (56 Points)
Final Design – SPiRiT Gold (68 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Key Project/Building Statistics:**

MCA FY 02, Project Number 030629
Design/Build
15 March 2004 Projected Completion Date
Cost $11 Mil (PA) $9.660 Mil (CWE)
Facility Area 38,000 Square Feet
Facility Footprint 78,940 Square Feet
Site Area 398,360 Square Feet
75 Person Occupancy
Construction Type (Steel Frame, Masonry Enclosure, Structural Standing Seam Metal Roof)
40% Energy Use Reduction

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites
- Erosion & Sediment Control
- Site Selection
- Energy Star Roof
- Site Ecology

Water Efficiency
- Water Efficient Fixtures
- Indigenous Landscape – No Irrigation

Energy and Atmosphere
- 40% Energy Use Reduction
- Building Systems Commissioning

Materials and Resources
- Local Materials
- Construction Waste Management
- Recycled Materials
- Certified Wood

Indoor Environmental Quality (IEQ)
- Mechanical Ventilation to ASHRAE Standards
- Separate Ventilation System for Copy Rooms
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Individual Room HVAC Control
- Noise Control

Facility Delivery Process
- Pre-Design Meeting
- Functional Analysis Concept Development (FACD) Charrette
- Identify Project Goals

Current Mission
- Quality of Life Improvements
- Functional & Healthy Work Environment

Future Missions
- Longevity of Materials & Systems Considered

| Ft. Gordon - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** | **Score 20** | **18** | **18** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 4 | 4 |
| 1.C5 | Reduced Site Disturbance | 2 | 2 | 2 |
| 1.C6 | Stormwater Management | 2 | 2 | 2 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 1 | 1 |
| 1.C8 | Light Pollution Reduction | 1 | 1 | 1 |
| 1.C9 | Optimize Site Features | 1 | 1 | 1 |
| 1.C10 | Facility Impact | 2 | 2 | 2 |
| 1.C11 | Site Ecology | 1 | 1 | 1 |
| **2.0** | **Water Efficiency** | **Score 5** | **0** | **2** |
| 2.C1 | Water Efficient Landscaping | 2 | 0 | 2 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 0 |
| **3.0** | **Energy and Atmosphere** | **Score 28** | **16** | **16** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 16 | 16 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 0 | 0 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 0 | 0 |
| 3.C6 | Green Power | 1 | 0 | 0 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** | **Score 13** | **5** | **5** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 1 | 1 |
| 4.C3 | Resource Reuse | 2 | 1 | 1 |
| 4.C4 | Recycled Content | 2 | 1 | 1 |
| 4.C5 | Local/Regional Materials | 2 | 1 | 1 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 1 | 1 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** | **Score 17** | **12** | **13** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 1 | 1 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 0 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 2 | 2 |
| 5.C4 | Low-Emitting Materials | 4 | 4 | 4 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 1 | 1 |
| 5.C6 | Controllability of Systems | 2 | 1 | 1 |
| 5.C7 | Thermal Comfort | 2 | 1 | 1 |
| 5.C8 | Daylight and Views | 2 | 1 | 1 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 0 | 0 |
| **6.0** | **Facility Delivery Process** | **Score 7** | **7** | **7** |
| 6.C1 | Holistic Delivery of Facility | 7 | 7 | 7 |
| **7.0** | **Current Mission** | **Score 6** | **6** | **6** |
| 7.C1 | Operation and Maintenance | 3 | 3 | 3 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 3 | 3 |
| **8.0** | **Future Missions** | **Score 4** | **4** | **3** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 2 | 2 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 2 | 1 |
| | **Total Score** | **100** | **68** | **70** |

| SPiRiT Sustainable Project Certification Levels | |
|---|---|
| SPiRiT Bronze | 25-34 |
| SPiRiT Silver | 35-49 |
| SPiRiT Gold | 50-74 |
| SPiRiT Platinum | 75-100 |

**SPiRiT Project Process:**

- Had Leadership Commitment (District Commander; Installation and Garrison Commander; DPW) and keep them informed/engaged (Yes)

Established SDD Trained/Focused Project Team @ Project Concept/planning phase (Yes/Established Integrated Design Team on Day 1)

- Integrated Project Team representatives included District Project Manager; A-E (Design-Build Contractor); DPW (Master Planner; Energy and Environmental Mgrs) (Yes)
- SDD/SPiRiT Team Training (Yes)
- Conducted Sustainable Planning & Design Charrettes (Yes)
- Set SPiRiT Goals @ Project concept/planning phase (Yes/SPiRiT Gold set @ Pre-design)
- SPiRiT Scoring Spreadsheet UPDATE were made and being tracked starting with Initial SPiRiT Goal/score and project updates thru BOD) (Yes)
- Documented SPiRiT assessment and scoring/points Results (Yes)
- Project costs w/in PA (Yes)
- Design-Build

**Findings/What's Working:**

- The Ft. Gordon Design/Build Contractor Team for this project to its great benefit, was highly motivated, actively engaged, and aggressively seeking ways to meet sustainability goals above and beyond point scoring of SPiRiT.
- The Design/Build Contractor Team welcomed participation in this sustainable design process, specifically addressing SPiRiT (LEED) as a means for them to obtain and maintain an industry competitive edge.
- The Design/Build Request for Proposal (RFP) was prepared in-house at Savannah District. The process utilized a two-step approach. Initial proposals were reduced in the first step to short-list of ten acceptable firms. Four made it to the final step, however, one dropped out during the final round. The successful bidder indicated that their proposal development costs were ~$100,00. The Design/Build approach was considered by the Ft. Gordon participants to be the optimum approach to achieve sustainable design.
- To control emphasis on sustainable elements as well as project costs, Savannah district mandated 34 points: 12 Site; 8 IEQ; 5 Delivery; 6 Current Mission and 3 future Mission.
- The Design/Build Contractor Team indicated that the RFP Proposal represented a balance between achieving points and cost. Their initial proposal was submitted at 72 SPiRiT points, but the current assessment is for 68 points. Trade-offs include 'best point value' for project, e.g. for the same cost, point A might be better to achieve than point B, within what the contractor felt would be a competitive range.
- A signed partnering agreement was prepared at the outset. All parties indicated that this was an essential component of a 'genuine' holistic process. Up front all stakeholders were committed to being actively engaged.
- The contractors experience is that sustainable design features do not always cost more and that it is false to assume so. They cited the simple example of carefully balancing site cut and fill to eliminate excessive earthmoving and the necessity of transporting materials off site.
- No points were claimed for Water Efficient Landscaping, however, water efficient, native and/or adapted plant species have been selected for no irrigation. In addition, the 'permanent' in ground sprinkling system installed for use during the time that plants are being established, will be abandoned in place once plants are established. The validation team grants two points for this credit as long as the system is disconnected following establishment so that it may not be used.
- The Design/Build Contractor Team initially 'targeted' additional commissioning, but only basic commissioning was accomplished.

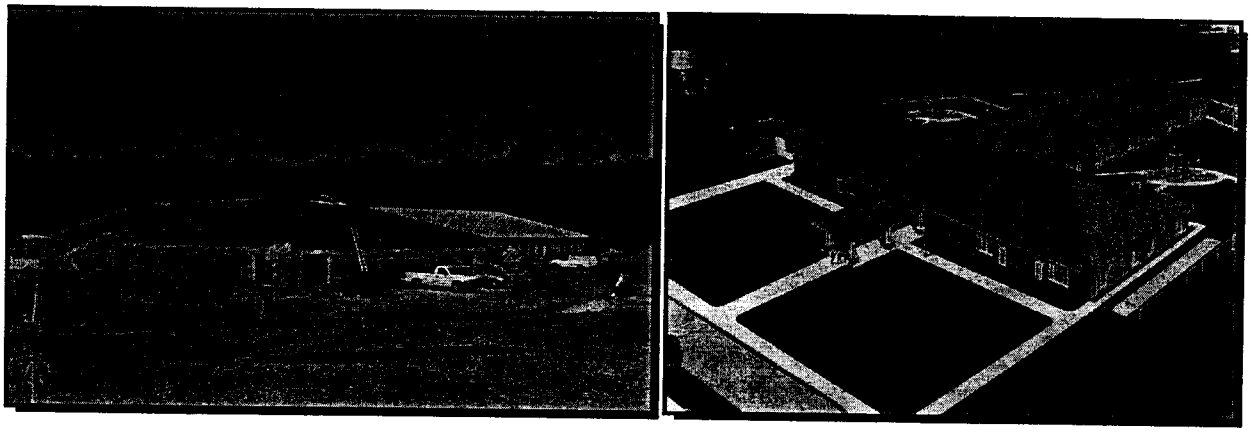
- The Design/Build Contractor indicated that 'Measurement and Verification' was a 'best point value' trade-off. It could have been installed, however, at Ft. Gordon (and in general for the Army) it would never be used, therefore, should not be included. The user needs to be actively engaged in the process so that these issues can be addressed. What is not wanted is as important as what is wanted.
- Very little wood is involved in MCA/Permanent construction in general, however, wooden concrete forms 'count' and were of certified lumber in this project.
- Solar tubes were employed to bring day lighting into interior spaces.
- 5.C10, Facility In-Use IAQ Management Plan (development) is considered to be prohibitively expensive and moot if 5.C4 Low-Emitting Materials are effectively employed. Holistic design processes look at the trade-offs between design approaches to establish the optimum value per point.
- Design/Build Contractor Team is compiling data on the SDD achievement for this project, will look into what it would take for the project to be LEED registered/certified, and make the file available to the Army in .pdf format at the end of the contact.
- Savannah District team likes the model set by Design/Build Contractor Team, TENG, and wants to follow it for Design-Bid-Build projects too.
- TENG argues that Design/Build is the best means to achieve sustainable design given the flexibility of the process; needed for 'new' approaches/projects.
- Signed partnering agreement real value in holistic process.
- Design/Build contractor for this project highly motivated, actively engaged, and aggressively seeking ways to meet sustainability goals above and beyond point scoring of SPiRiT.
- Design/Build contractor indicated that the process, and specifically SPiRiT (LEED) was good for them, giving them what they felt was an edge over their competitors.

**Improvement Opportunities/Lessons Learned:**

- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 2.C1 Water Efficient Landscaping; 2.C3 Water Use Reduction; 5.C2 Increase Ventilation Effectiveness; and 8.C2 Adaptation, Renewal and Future Uses (Adaptability).

# Ft. Meade, MD, Child Development Center

Facility Category Code 740 14 - Child Development Center [Storage Shed; & Playground w/Equipment] Not an ACSIM/USACE Designated FY02 Showcase Project – U. S. Army Engineer District, Baltimore, Sustainable Design POC - Andrea E. DeLaPena]



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

Construct a standard-design child development center (CDC) with a fenced playground and storage sheds. Install an energy monitoring and control system (EMCS). Supporting facilities include utilities; electric service; fire protection and alarm system, and sprinkler system; paving, walks, curbs, and gutters; parking; access roads; storm drainage; information systems; and site improvements. Access for the handicapped will be provided. Heating will be provided by a gas-fired self-contained system. Air conditioning (70 tons) will be provided by a self-contained system. Demolish one building (22,500 SF). Anti-terrorist/force protection measures will include strengthening of the building components and the provision of anti-vehicular measures such as bolsters, architectural planters and access gates. The costs of supporting facilities for this project are above normal because of the greater requirement for parking and the need to relocate existing utilities around the site combined with one-for-one demolition that is required by the facilities reduction program. Comprehensive interior design services are required.

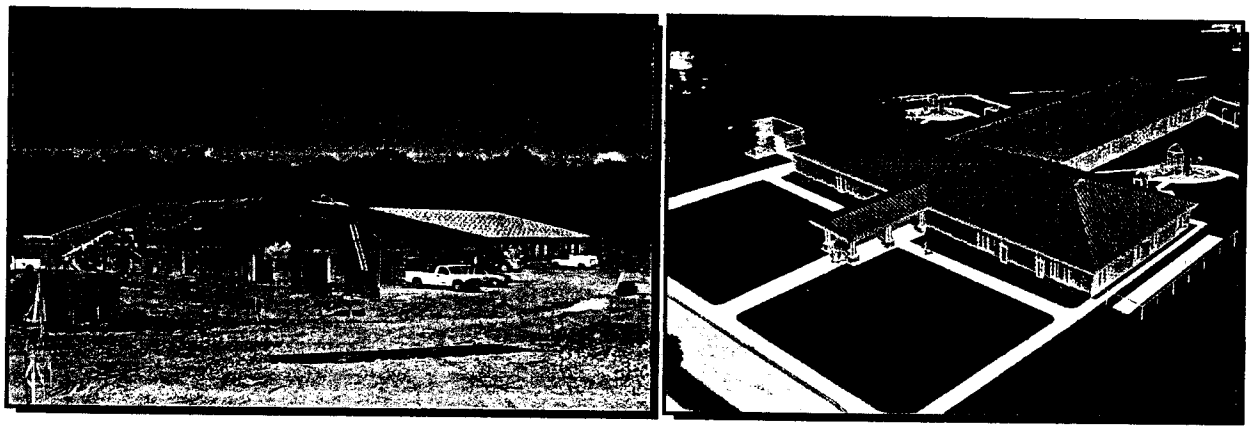
**SPiRiT Self-assessment score/Rating by Project Team:** 40 Points/SILVER
**Validation Team Score/Rating:** 38 Points/SILVER
**Reason for Differences:** SPiRiT criteria interpretation.

**Ft. Meade Project Team:**

Design/Construction Agent – U. S. Army Engineer District, Baltimore
Public Works Director - LTC Rodney W. Gettig
Project Manager - Scott Drumheller
Child & Youth Services - Martha McClary & Bea Curl
Installation Master Planner - Andy Bagnall
Criteria Development Team Leader - Antoine Plessy
Value Engineer - John Vogel
Project Engineer - Pat Sampsel
Design/Build Team - Samaha Associates, PC & Desbuild Inc

# Ft. Meade, MD, Child Development Center

Facility Category Code 740 14 - Child Development Center [Storage Shed; & Playground w/Equipment] Not an ACSIM/USACE Designated FY02 Showcase Project – U. S. Army Engineer District, Baltimore, Sustainable Design POC - Andrea E. DeLaPena]



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**SPiRiT Self-assessment score/Rating by Project Team:** 40 Points/SILVER
**Validation Team Score/Rating:** 38 Points/SILVER
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**Ft. Meade Project Team:**

Design/Construction Agent – U. S. Army Engineer District, Baltimore
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Value Engineer - John Vogel
Project Engineer - Pat Sampsel
Design/Build Team - Samaha Associates, PC & Desbuild Inc

**SPiRiT Rating:**

Target rating – SPiRiT Bronze (25 Points)
Programmatic Design (Planning Charrette/1391) (not applicable)
Parametric (Concept) Design SPiRiT Silver (31 Points)
Final Design – SPiRiT Silver (40 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Building Statistics:**

FY02 MCA Program, Project Number 023721
Design Build, Army Standard Design
February 2004 Projected Completion Date
Costs $5.8 Mil (PA) and $6.0Mil (CWE)
Facility Area 2,285 Square Meters
Facility Footprint 2,285 Square Meters
303 Child Occupancy + 75 Staff Members
Construction Type (Masonry Perimeter Bearing Walls, Steel Trusses/Interior Partitions, Standing Seam Metal Roof)
10% Energy Use Reduction

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites

- Stormwater Management & Sediment /Erosion Control Plan to Strict Maryland Department of the Environment Requirements
- Shared Parking With Adjacent Facilities
- Existing Stormwater Management Infrastructure
- Reduced impervious area by 35%
- Design Respects/Avoids Adjacent Stream Buffer Area
- Complies With Maryland Forest Conservation Act Requirements

Water Efficiency

- Maximized Use of Native Plant Species
- Landscape Irrigation System Not Required

Materials and Resources

- Recycled Content Structure

Indoor Environmental Quality (IEQ)

- Adherence to ASHRAE Air Requirements
- Facility IEQ Design to Strict Child Development Center Standards & Guidelines
- Use of Tobacco Products in or Around Facilities Prohibited
- Air Diffusion Maximized for Each Space.
- Filtration Media Replaced Prior to Occupancy
- HVAC System Controls Limit Building Humidity
- Permanent Carbon Dioxide Monitoring System
- Low Emitting Materials; Low VOC Paints & Adhesives
- Natural Day Lighting for All Occupied Spaces
- Sound Attenuation for All Corridors, Modules, Administrative Spaces, & Toilet Rooms
- Design to Control Indoor Chemical/pollutants at the Source

Current Mission

- CDC Standard Design / CDC Accreditation Requirements.

Future Missions

- Furnishing & Finishes and Playground Equipment Selected for Life-Cycle Durability & Maintenance Ease

SPiRiT Validation

| Ft. Meade - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** | **Score 20** | **11** | **10** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 1 | 1 |
| 1.C5 | Reduced Site Disturbance | 2 | 0 | 0 |
| 1.C6 | Stormwater Management | 2 | 2 | 2 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 0 | 0 |
| 1.C8 | Light Pollution Reduction | 1 | 1 | 1 |
| 1.C9 | Optimize Site Features | 1 | 1 | 0 |
| 1.C10 | Facility Impact | 2 | 1 | 1 |
| 1.C11 | Site Ecology | 1 | 1 | 1 |
| **2.0** | **Water Efficiency** | **Score 5** | **1** | **3** |
| 2.C1 | Water Efficient Landscaping | 2 | 1 | 2 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 1 |
| **3.0** | **Energy and Atmosphere** | **Score 28** | **1** | **4** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 0 | 4 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 0 | 0 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 1 | 0 |
| 3.C6 | Green Power | 1 | 0 | 0 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** | **Score 13** | **0** | **1** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 0 | 0 |
| 4.C3 | Resource Reuse | 2 | 0 | 0 |
| 4.C4 | Recycled Content | 2 | 0 | 1 |
| 4.C5 | Local/Regional Materials | 2 | 0 | 0 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 0 | 0 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** | **Score 17** | **15** | **14** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 1 | 1 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 1 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 2 | 1 |
| 5.C4 | Low-Emitting Materials | 4 | 4 | 4 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 1 | 1 |
| 5.C6 | Controllability of Systems | 2 | 0 | 0 |
| 5.C7 | Thermal Comfort | 2 | 2 | 2 |
| 5.C8 | Daylight and Views | 2 | 2 | 2 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 1 | 1 |
| **6.0** | **Facility Delivery Process** | **Score 7** | **4** | **0** |
| 6.C1 | Holistic Delivery of Facility | 7 | 4 | 0 |
| **7.0** | **Current Mission** | **Score 6** | **6** | **4** |
| 7.C1 | Operation and Maintenance | 3 | 3 | 1 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 3 | 3 |
| **8.0** | **Future Missions** | **Score 4** | **2** | **2** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 2 | 2 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 0 | 0 |
| | **Total Score** | **100** | **40** | **38** |

**SPiRiT Sustainable Project Certification Levels**

| | |
|---|---|
| **SPiRiT Bronze** | 25-34 |
| **SPiRiT Silver** | 35-49 |
| **SPiRiT Gold** | 50-74 |
| **SPiRiT Platinum** | 75-100 |

**SPiRiT Project Process:**

- Had Leadership Commitment (District Commander; Installation and Garrison Commander; DPW) and keep them informed/engaged (No)
- Established SDD Trained/Focused Project Team @ Project Concept/planning phase (No)
- Integrated Project Team representatives included District Project Manager; A-E (Design-Build Contractor); DPW (Master Planner; Energy and Environmental Mgrs) (No)
- SDD/SPiRiT Team Training (No)
- Conducted Sustainable Planning & Design Charrettes (No)
- Set SPiRiT Goals @ Project concept/planning phase (Yes/Minimum Bronze rating/points set @ project initiation by District PM)
- SPiRiT Scoring Spreadsheet UPDATE were made and being tracked starting with Initial SPiRiT Goal/score and project updates thru BOD) (No)
- Documented SPiRiT assessment and scoring/points Results (No)
- Project costs w/in PA (Yes)
- Design-Build

**Findings/What's Working:**

- A SPiRiT Bronze rating required by Baltimore District in the RFP, but no points or specific, requirements were specified, neither were any documentation or validation requirements to prove the rating achieved specified.
- The Design/Build contractor Team designer of record, Mr. Mark Manetti, Samaha Associates, presented project ratings, point by point; It was clear from the outset of the project validation site meeting that the SPiRiT rating had not been reviewed since the proposal stage; No Project Team attendees had an understanding what the current project rating was, including the Samaha representative, nor were any other than the AE of record involved in establishing the rating; Samaha came to the meeting expecting actually to resolve the SPiRiT rating. Concerning the sustainability aspects of this project, it was clear that there was no justification for holistic design points.
- Maryland Department of the Environment (MDE) requirements, in general, are more stringent than LEED/SPiRiT, therefore if MDE certification is accomplished, many SPiRiT/LEED points will be by default, obtained/certified. Examples include: Erosion, Sedimentation and Water Quality Control, Installation/Base Urban Redevelopment, Reduced Site Disturbance, Stormwater Management, and Site Ecology. Specifically, MDE and a 'bay area protection law' govern storm water, open space, and habitat issues.
- Similarly, Army Child Development Services (CDC) requirements are more stringent than LEED/SPiRiT, and if CDC certification is accomplished, many SPiRiT points will be by default, obtained/certified. Examples include: Measurement and Verification, Minimum IAQ Performance, IAQ Carbon Dioxide (CO2) Monitoring, Increase Ventilation Effectiveness, Low-Emitting Materials, Indoor Chemical and Pollutant Source Control, Thermal Comfort, Daylight and Views, Acoustic Environment /Noise Control, Facility In-Use IAQ Management Plan, and Operation and Maintenance.
- As CDC both 'certifies' a facility prior to occupancy, and re-certifies a facility annually, certain aspects of 'commissioning' might be considered as met for this and other child care facilities projects.
- The Project Team made an argument for points under 'brownfields' since the site was previously occupied by a vehicle maintenance facility. No points, however, are warranted. There was no definition of site contamination meeting the EPA 'Brownfield' definition, there was no remediation accomplished in the project, and the site was not selected based on it being contaminated to be remediated in the course of the project. In fact, the site had been 'cleared' at least three years earlier, such that MDE considered it 'open space' in its storm water run off and ecosystem impact calculations.

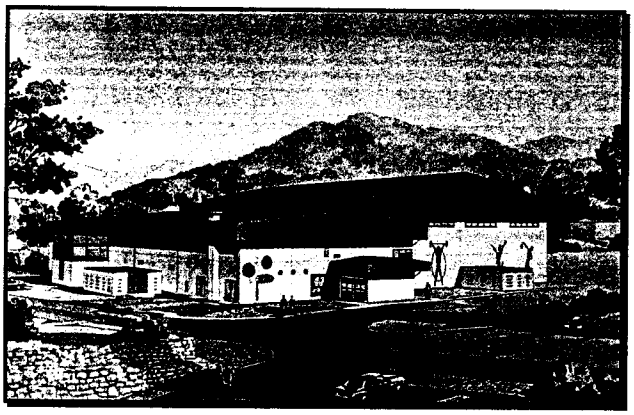
- Traditional PDTs and linear design processes will not achieve desired SDD results. To justify SPiRiT points for holistic design PDTs must be lead by individuals trained and experienced in sustainable design, comprised of key stakeholders, with all team members receiving training in sustainable design. The PDT must identify SDD goals, tracking and documenting theirprogress, through execution of design, review, and scoring charrettes at critical project stages.
- In general, SPiRiT points are to be documented in standard project design documentation by the provision of appropriate specifications, drawings, and design analyses which present calculations and information demonstrating how the design solution achieves SPiRiT requirements. SPiRiT Points cannot be justified through simple reference to other documents.
- Stream buffers, reforestation and other site development features warrant points under 1.C11, primarily as a result of meeting MDE requirements for protection of waterways.
- 5.C1 IAQ Carbon Dioxide (CO2) monitoring was specified as required in the required in RFP to meet CDC requirements. Army projects are designed to meet ASHRAE requirements and therefore meet 5.C2 Increase Ventilation Effectiveness.

**Improvement Opportunities/Lessons Learned**

- Bronze rating required in RFP, but no points, requirements specified; validation requirements to prove Bronze rating not specified.
- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 1.C4 Alternative Transportation (Showers); 1.C5 Reduced Site Disturbance; 1.C7 Landscape and Exterior Design to Reduce Heat Islands (ES Roof); 2.C1 Water Efficient Landscaping; 4.C2 Construction Waste Management; and 6.C1 Holistic Delivery of Facility.
- Sustainable Design Development requirements should be included in Design Build submittal requirements and in design criteria.

# Camp Carroll, Korea, Physical Fitness Training Center

Facility Category Code *721 11* – U. S. Army Engineer District, Far East, Sustainable Design
POC - DoShin L. Park



10. Description of Proposed Construction *(Para 10 from DD Form 1391)*

Construct a standard-design two-story physical fitness center, a basketball court, four handball and racquetball courts. Anti-terrorism/force protection measures include laminated glass, blast-resistant door and window frames, ballistic obscuring, and seismic detailing. Supporting facilities include utilities, security lighting, fire protection and alarm system, parking; fuel oil storage tanks; paving; walks, curbs and gutters; storm drainage; exterior information systems; and site improvements. Demolish one temporary golf driving range. Heating will be provided by a self-contained oil-fired system. Air conditioning (100 tons) will be provided by a self-contained system. Comprehensive interior design services are required. Access for the handicapped will be provided.

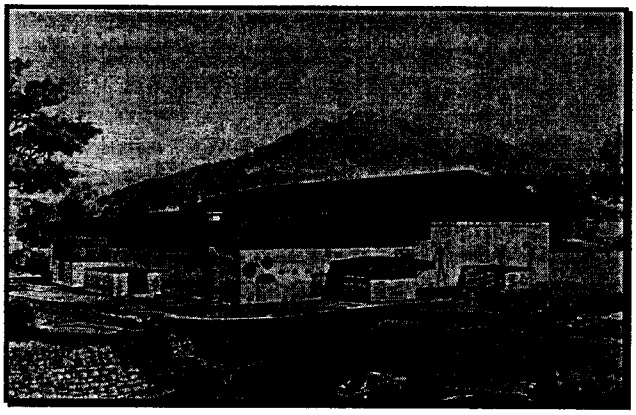
**SPiRiT Self-assessment score/Rating by Project Team:** 32 Points/BRONZE
**Validation Team Score/Rating:** 28 Points/Bronze
**Reason for Differences:** SPiRiT criteria interpretation.

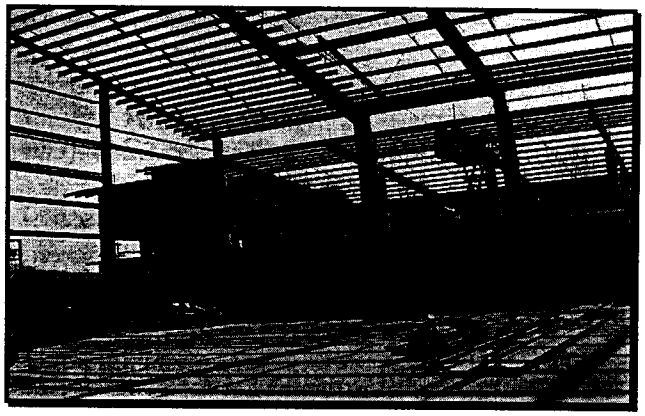
**Camp Carroll Project Team:**

Design Agent – U. S. Army Engineer District, Far East
Public Works Director – Kevin Jung
Project Manager – Ted Song
Master Planner – Ronnie Lee
A/E – Far East District Design Branch
Contractor – Byucksan Construction Company

# Camp Carroll, Korea, Physical Fitness Training Center

Facility Category Code *721 11* – U. S. Army Engineer District, Far East, Sustainable Design
POC - DoShin L. Park





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**SPiRiT Self-assessment score/Rating by Project Team:** 32 Points/BRONZE
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**Camp Carroll Project Team:**

Design Agent – U. S. Army Engineer District, Far East
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A/E – Far East District Design Branch
Contractor – Byucksan Construction Company

**SPiRiT Rating:**

Target rating – SPiRiT Bronze
Programmatic Design (Planning Charrette/1391) (not applicable)
Parametric (Concept) Design (not applicable)
Final Design – SPiRiT Bronze (32 Points)
Beneficial Occupancy Date (BOD)– (TBD)

**Key Project/Building Statistics:**

MCA, FY 02, Project Number 52518
Design Bid Build
Projected Completion Dec 2003
Original Cost $8.1 Mil (PA) $5.8 Mil (CWE)
Facility Area 3,296 Square Meters
Facility Footprint 3,300 Square Meters
350 Person Occupancy
Construction Type (Steel Framing with CMU exterior wall, & Standing seam metal Roof)
10% Energy Use Reduction

**Sustainable Design and Development Features by SPiRiT Major Credit Area**

Sustainable Sites
- Erosion & Sediment Control
- Site Selection

Energy and Atmosphere
- Water Efficient Fixtures
- Indigenous Landscape – No Irrigation

Materials and Resources
- Local Materials

Indoor Environmental Quality (IEQ)
- Separate Ventilation System for Smoking Rooms
- Construction IAQ Management
- Low /Zero VOC Carpets, Paints, Sealants
- Individual Room HVAC Control

Current Mission
- Quality of Life Improvements
- Operation & Maintenance Considered
- Design for soldier and workforce productivity and Retention

Future Missions
- Longevity of Materials & Systems Considered
- No usage change expected

SPiRiT Validation

| Camp Carroll - Facility Points Summary | | Max | Proj | Team |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites** | **Score 20** | **8** | **8** |
| 1.R1 | Erosion, Sedimentation and Water Quality Control | [Reqd] | X | X |
| 1.C1 | Site Selection | 2 | 2 | 2 |
| 1.C2 | Installation/Base Urban Redevelopment | 2 | 2 | 2 |
| 1.C3 | Brownfield Redevelopment | 1 | 0 | 0 |
| 1.C4 | Alternative Transportation | 4 | 2 | 2 |
| 1.C5 | Reduced Site Disturbance | 2 | 0 | 0 |
| 1.C6 | Stormwater Management | 2 | 1 | 1 |
| 1.C7 | Landscape and Exterior Design to Reduce Heat Islands | 2 | 0 | 0 |
| 1.C8 | Light Pollution Reduction | 1 | 0 | 0 |
| 1.C9 | Optimize Site Features | 1 | 0 | 0 |
| 1.C10 | Facility Impact | 2 | 1 | 1 |
| 1.C11 | Site Ecology | 1 | 0 | 0 |
| **2.0** | **Water Efficiency** | **Score 5** | **0** | **0** |
| 2.C1 | Water Efficient Landscaping | 2 | 0 | 0 |
| 2.C2 | Innovative Wastewater Technologies | 1 | 0 | 0 |
| 2.C3 | Water Use Reduction | 2 | 0 | 0 |
| **3.0** | **Energy and Atmosphere** | **Score 28** | **0** | **4** |
| 3.R1 | Fundamental Building Systems Commissioning | [Reqd] | X | X |
| 3.R2 | Minimum Energy Performance | [Reqd] | X | X |
| 3.R3 | CFC Reduction in HVAC&R Equipment | [Reqd] | X | X |
| 3.C1 | Optimize Energy Performance | 20 | 0 | 4 |
| 3.C2 | Renewable Energy | 4 | 0 | 0 |
| 3.C3 | Additional Commissioning | 1 | 0 | 0 |
| 3.C4 | <<Deleted>> | | | |
| 3.C5 | Measurement and Verification | 1 | 0 | 0 |
| 3.C6 | Green Power | 1 | 0 | 0 |
| 3.C7 | Distributed Generation | 1 | 0 | 0 |
| **4.0** | **Materials and Resources** | **Score 13** | **6** | **2** |
| 4.R1 | Storage & Collection of Recyclables | [Reqd] | X | X |
| 4.C1 | Building Reuse | 3 | 0 | 0 |
| 4.C2 | Construction Waste Management | 2 | 0 | 0 |
| 4.C3 | Resource Reuse | 2 | 0 | 0 |
| 4.C4 | Recycled Content | 2 | 4 | 0 |
| 4.C5 | Local/Regional Materials | 2 | 2 | 2 |
| 4.C6 | Rapidly Renewable Materials | 1 | 0 | 0 |
| 4.C7 | Certified Wood | 1 | 0 | 0 |

| | | Max | Proj | Team |
|---|---|---|---|---|
| **5.0** | **Indoor Environmental Quality** | **Score 17** | **7** | **8** |
| 5.R1 | Minimum IAQ Performance | [Reqd] | X | X |
| 5.R2 | Environmental Tobacco Smoke (ETS) Control | [Reqd] | X | X |
| 5.C1 | IAQ Carbon Dioxide (CO2) Monitoring | 1 | 1 | 1 |
| 5.C2 | Increase Ventilation Effectiveness | 1 | 1 | 1 |
| 5.C3 | Construction IAQ Management Plan | 2 | 2 | 2 |
| 5.C4 | Low-Emitting Materials | 4 | 0 | 0 |
| 5.C5 | Indoor Chemical and Pollutant Source Control | 1 | 1 | 1 |
| 5.C6 | Controllability of Systems | 2 | 0 | 0 |
| 5.C7 | Thermal Comfort | 2 | 0 | 0 |
| 5.C8 | Daylight and Views | 2 | 1 | 1 |
| 5.C9 | Acoustic Environment /Noise Control | 1 | 1 | 1 |
| 5.C10 | Facility In-Use IAQ Management Plan | 1 | 0 | 1 |
| **6.0** | **Facility Delivery Process** | **Score 7** | **7** | **0** |
| 6.C1 | Holistic Delivery of Facility | 7 | 7 | 0 |
| **7.0** | **Current Mission** | **Score 6** | **4** | **6** |
| 7.C1 | Operation and Maintenance | 3 | 1 | 3 |
| 7.C2 | Soldier and Workforce Productivity and Retention | 3 | 3 | 3 |
| **8.0** | **Future Missions** | **Score 4** | **0** | **0** |
| 8.C1 | Functional Life of Facility and Supporting Systems | 2 | 0 | 0 |
| 8.C2 | Adaptation, Renewal and Future Uses | 2 | 0 | 0 |
| | **Total Score** | **100** | **32** | **28** |

| SPiRiT Sustainable Project Certification Levels | |
|---|---|
| **SPiRiT Bronze** | 25-34 |
| **SPiRiT Silver** | 35-49 |
| **SPiRiT Gold** | 50-74 |
| **SPiRiT Platinum** | 75-100 |

**Findings/What's Working**

- The Fitness Center represented the Far East District's first experience using SPiRiT on a design project. The Fitness Center design was executed in-house based on a standard Design. The directive on the use of SPiRiT was received when the design was 90% complete. The rating, therefore, was prepared after the fact and only by the Far East District.
- As with any 'new' effort, in this case, the implementation of sustainable design criteria, there was a steep learning curve, compounded by the stage of design when the directive was achieved. Designers and engineers were resistant to application of new criteria of which they knew little. Additional effort was required for data gathering, research and the application of new techniques.
- Knowledge and acceptance of sustainable design and development is spreading in the local design and engineering community (District and contract Architect/Engineers) as well as in the user community. Leadership is supportive, however, the level of support and commitment varies.
- There was no charrette accomplished for this project, design and/or sustainable design, primarily in that this was a simple project using a standard design with known requirements.
- Certain technologies/strategies are not appropriate for the Korean theater. Variable Air Volume (VAV) HVAC systems, although successful in helping to achieve energy savings, are not supported by the Department of Public Works. Current staff cannot maintain them properly.
- Far East District concluded that there were many areas were they could have garnered more points had they received the directive earlier and employed SPiRiT throughout the design. Occupancy sensors for lighting control, commissioning, and holistic design were all mentioned as being possible areas were points could have been achieved at little or no additional cost.
- The Far East District considered use of the standard design to be a barrier to achieving some SPiRiT points. They considered the standard design floor plan to be fixed and therefore felt they were unable to minimize the facility footprint and optimize the layout.
- When asked for input on areas they needed help, the Far East District cited two items. 1) Directives mandating the use of specific technologies/strategies to insure their adoption, citing occupancy sensors for lighting control as an example; and 2) Across the board education on sustainable design, e.g. designers, leaders and users.
- When asked for input on regional difficulties for implantation of SPiRiT, the Far East District cited the following IEQ materials issues relating to standards and availability as barriers: 1. Adhesive VOCs meeting South Coast Air Quality Management District (SCAQMD) Rule #1168 limits; 2. Paints and Coatings VOCs meeting Green Seal limits; and 3. Urea-formaldehyde resin free composite wood or agrifiber products. The perception was that products required SCAQMD and Green Seal certification. In reality, products need only meet the limits established by these organizations. The barrier is that information on the performance of local materials is either not available or not as readily available as in the US.

**Improvement Opportunities/Lessons Learned:**

- During project review, the validation team concluded that there was a high probability of achieving the following SPiRiT points validation given a more thorough/complete sustainable development process: 1.C5 Reduced Site Disturbance; 1.C7 Landscape and Exterior Design to Reduce Heat Islands (ES Roof); 2.C1 Water Efficient Landscaping; 2.C3 Water Use Reduction; 4.C2 Construction Waste Management; 4.C5 Rapidly Renewable Materials; 5.C4 Low-Emitting Materials; 5.C7 Thermal Comfort; 6.C1 Holistic Delivery of Facility; and 8.C2 Adaptation, Renewal and Future Uses (Adaptability).

**Appendix 1**

# Sustainable Project Rating Tool (SPiRiT)

## Version 1.4.1

**U. S. Army Corps of Engineers**
**U. S. Army Assistant Chief of Staff for Installation Management**

June 2002

## 1.0 Sustainable Sites — Score 20

### 1.R1 Erosion, Sedimentation, and Water Quality Control [1] — Reqd.

Intent: Control erosion and pollutants to reduce negative impacts on water and air quality.

Requirement:

- ☐ Design a site sediment and erosion control plan and a pollution prevention plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:
  - Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
  - Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
  - Prevent hazardous material discharge into storm water systems.
  - Prevent petroleum oils and lubricants (POL) discharge into storm water systems.

Technologies /Strategies: The EPA standard lists numerous measures such as silt fencing, sediment traps, oil grit separators, construction phasing, stabilization of steep slopes, maintaining vegetated ground cover and providing ground cover that will meet this prerequisite.

### 1.C1 Site Selection [1]

Intent: Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site. Select site based on functional adjacencies/relationships and land use compatibility.

Requirement:

- ☐ Do not develop buildings on portions of sites that meet any one of the following criteria: **1**
  - Prime training or maneuver land.
  - Land whose elevation is lower than 5 ft. above the 100-year flood elevation as defined by FEMA.
  - Land that provides habitat for any species on the Federal or State threatened or endangered list.
  - Within 100 feet of any wetland as defined by 40 CFR, Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent.
- ☐ Select site based on functional adjacencies/relationships and land use compatibility. **1**
  - Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.
  - Select site in area of high density.
  - Site facilities based on the strength of their relationships to other facilities/land-uses to limit travel distances. The stronger the relationship/functional interaction, the closer the distance between two facilities.
  - Select for distance to installation/base transit systems and access to pedestrian ways and bike paths.
  - Select for development previously used or developed suitable and available sites.

Technologies /Strategies: Screen potential building sites for these criteria and/or ensure that these criteria are addressed by the designer during the conceptual design phase. Utilize landscape architects, ecologists, environmental engineers, civil engineers, and similar professionals for the screening process. New wetlands constructed as part of stormwater mitigation or other site restoration efforts are not affected by the restrictions of this prerequisite.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 1.0 Sustainable Sites (Continued)

### 1.C2 Installation/Base Redevelopment [1]

Intent: Channel development to installation/base cantonment areas with existing infrastructure, protecting greenfields and preserving habitat and natural resources.

Requirement:

- ❑ Increase localized density to conform to existing or desired density goals by utilizing sites that are located within existing cantonment areas of high development density. **1**
- ❑ Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure. **1**

Technologies /Strategies: During the site selection process give preference to previously developed sites with installation/base cantonment redevelopment potential such as facility reduction program cleared sites.

### 1.C3 Brownfield Redevelopment [1]

Intent: Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

Requirement:

- ❑ Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements OR Develop a brownfield site (a site that has been contaminated by previous uses). **1**

Technologies /Strategies: Screen potential damaged sites for these criteria prior to selection for rehabilitation.

Utilize EPA OSWER Directive 9610.17 and ASTM Standard Practice E1739 for site remediation where required.

### 1.C4 Alternative Transportation [1]

Intent: Reduce pollution and land development impacts from automobile use.

Requirement:

- ❑ Locate building within ½ mile of installation/base transit systems. **1**
- ❑ Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants. **1**
- ❑ Locate building within 2 miles of alternative-fuel refueling station(s). **1**
- ❑ Size parking capacity not to exceed minimum installation/base cantonment requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants. **1**

Technologies /Strategies: Select sites near public installation/base transit served by safe, convenient pedestrian pathways.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 1.0 Sustainable Sites (Continued)

### 1.C5 Reduced Site Disturbance [1]

Intent: Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirement:

- ❑ On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation. 1

- ❑ Reduce the development footprint (including building, access roads and parking) to exceed the installation/base's/base's master plan local zoning's open space requirement for the site by 25% or in accordance with installation/base policy on open space set asides, whichever is greater. 1

Technologies /Strategies: Note requirements on plans and in specifications. Establish contractual penalties for destruction of trees and site areas noted for protection. Reduce footprints by tightening program needs and stacking floor plans. Establish clearly marked construction and disturbance boundaries. Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas. Work with local horticultural extension services, native plant societies, or installation/base agronomy staff to select indigenous plant species for site restoration and landscaping.

### 1.C6 Stormwater Management [1]

Intent: Limit disruption of natural water flows by minimizing storm water runoff, increasing on-site infiltration and reducing contaminants.

Requirement: Implement a stormwater management plan that results in:

- ❑ No net increase in the rate or quantity of stormwater runoff from undeveloped to developed conditions; OR, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff. 1

- ❑ Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA-840-B-92-002 1/93). 1

Technologies /Strategies: Significantly reduce impervious surfaces, maximize on-site stormwater infiltration, and retain pervious and vegetated areas. Capture rainwater from impervious areas of the building for groundwater recharge or reuse within building. Use green/vegetated roofs. Utilize biologically-based and innovative stormwater management features for pollutant load reduction such as constructed wetlands, stormwater filtering systems, bioswales, bio-retention basins, and vegetated filter strips. Use open vegetated swales to reduce drainage velocity and erosion, reduce system maintenance, increase vegetative variety and support wildlife habitat where space permits.

### 1.C7 Landscape and Exterior Design to Reduce Heat Islands [2]

Intent: Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirement:

- ❑ Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored/ high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space under-ground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area. 1

- ❑ Use ENERGY STAR Roof compliant, high-reflectance AND low emissivity roofing (initial reflectance of at least .65 and three-year-aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area. 1

Technologies /Strategies: Employ design strategies, materials, and landscaping designs that reduce heat absorption of exterior materials. Note albedo/reflectance requirements in the drawings and specifications. Provide shade (calculated on June 21, noon solar time) using native or climate tolerant trees and large shrubs, vegetated trellises, or other exterior structures supporting vegetation. Substitute vegetated surfaces for hard surfaces. Explore elimination of blacktop and the use of new coatings and integral colorants for asphalt to achieve light colored surfaces.

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[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

[2] © U. S. Green Building Council. Used by permission.

## 1.0 Sustainable Sites (Continued)

**1.C8** **Light Pollution Reduction** [1]

Intent: Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.

Requirement: ❑ Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site. **1**

Technologies /Strategies: Consult IESNA Recommended Practice Manual: Lighting for Exterior Environments for Commission Internationle de l'Eclairage (CIE) zone and pre and post curfew hour descriptions and associated ambient lighting level requirements. Ambient lighting for pre-curfew hours for CIE zones range between .01 footcandles for areas with dark landscapes such as parks, rural, and residential areas, and 1.5 footcandles for areas with high ambient brightness such as installation/base areas with high levels of nighttime activity. Design site lighting and select lighting styles and technologies to have a minimal impact off-site and minimal contribution to sky glow. Minimize lighting of architectural and landscape features. Exterior lighting should be consistent with security lighting requirements.

**1.C9** **Optimize Site Features**

Intent: Optimize utilization of the site's existing natural features and placement of man-made features on the site.

Requirement: ❑ Perform both of the following: **1**

- Maximize the use of free site energy.
- Plan facility, parking and roadways to "fit" existing site contours and limit cut and fill.

Technologies /Strategies: Evaluate site resources to ascertain how each can enhance the proposed project and visa versa. Work to maximum advantage of the site's solar and wind attributes. Use landscaping to optimize solar and wind conditions and to contribute to energy efficiency; Locate and orient the facility on the site to optimize solar and wind conditions.

**1.C10** **Facility Impact**

Intent: Minimize negative impacts on the site and on neighboring properties and structures; avoid or mitigate excessive noise, shading on green spaces, additional traffic, obscuring significant views, etc.

Requirement: ❑ Cluster facilities to reduce impact, access distance to utilities and sufficient occupant density to support mass transit. **1**

❑ Collaborate with installation/base and community planners to identify and mitigate potential impacts of the project beyond site boundaries, and transportation planners to insure efficient public transport. **1**

Technologies /Strategies: Involve local/regional planners and community members in installation/base master planning processes. Recognize the context and the impact of a project beyond site boundaries, and integrate it with the larger installation/base/community context/land use.

**1.C11** **Site Ecology**

Intent: Identify and mitigate all existing site problems including contamination of soil, water, and air, as well as any negative impacts caused by noise, eyesores, or lack of vegetation, enhancing or creating new site habitat.

Requirement: ❑ Develop site environmental management and mitigation plan. **1**

Technologies /Strategies: Understand site and surrounding ecosystem interdependence and interconnectivity. Plan landscaping scheme to incorporate biodiversity. Preserve/enhance existing trees, hydrological features, ecosystems, habitats, and cultural resources. Increase the existence of healthy habitat for native species. Reintroduce native plants and trees where they have been destroyed by previous development.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 2.0 Water Efficiency — Score 5

### 2.C1 Water Efficient Landscaping [2]

Intent: Limit or eliminate the use of potable water for landscape irrigation.

Requirement:

- ❑ Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means. **1**
- ❑ Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems. **1**

Technologies /Strategies: Develop a landscaping water use baseline according to the methodology outlined in the LEED Reference Guide. Specify water-efficient, native or adapted, climate tolerant plantings. High efficiency irrigation technologies include micro irrigation, moisture sensors, or weather data based controllers. Feed irrigation systems with captured rainwater, gray water, or on-site treated wastewater.

### 2.C2 Innovative Wastewater Technologies [2]

Intent: Reduce generation of wastewater and potable water demand, while increasing local aquifer recharge.

Requirement:

- ❑ Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards. **1**

Technologies /Strategies: Develop a wastewater baseline according to the methodology outlined in the LEED Reference Guide. Implement decentralized on-site wastewater treatment and reuse systems. Decrease the use of potable water for sewage conveyance by utilizing gray and/or black water systems. Non-potable reuse opportunities include, toilet flushing, landscape irrigation, etc. Provide advanced wastewater treatment after use by employing innovative, ecological, on-site technologies including constructed wetlands, a mechanical recirculating sand filter, or aerobic treatment systems.

### 2.C3 Water Use Reduction [1]

Intent: Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirement:

- ❑ Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act (EPACT) of 1992 fixture performance requirements. **1**
- ❑ Exceed the potable water use reduction by an additional 10% (30% total efficiency increase). **1**

Technologies /Strategies: Develop a water use baseline including all water consuming fixtures, equipment, and seasonal conditions according to methodology guidance outlined in the LEED Reference Guide. Specify water conserving plumbing fixtures that exceed Energy Policy Act (EPACT) of 1992 fixture requirements in combination with ultra high efficiency or dry fixture and control technologies. Specify high water efficiency equipment (dishwashers, laundry, cooling towers, etc.). Use alternatives to potable water for sewage transport water. Use recycled or storm water for HVAC/process make up water. Install cooling tower systems designed to minimize water consumption from drift, evaporation and blowdown.

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## 3.0 Energy and Atmosphere — Score 28

### 3.R1 Fundamental Building Systems Commissioning [1] — Reqd.

Intent: Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirement: ❑ Implement all of the following fundamental best practice commissioning procedures.

- Engage a commissioning authority.
- Develop design intent and basis of design documentation.
- Include commissioning requirements in the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and documentation.
- Complete a commissioning report.

Technologies /Strategies: Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Perform additional commissioning in accordance with the DOE Building Commissioning Guide, Version 2.2. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional commissioning guides. Specify pre-occupancy baseline IAQ testing at time of commissioning. Test for indoor air concentrations of CO, CO2, total VOCs and particulates. Test to assure that adequate ventilation rates have been achieved prior to initial occupancy.

### 3.R2 Minimum Energy Performance [1] — Reqd.

Intent: Establish the minimum level of energy efficiency for the base building and systems.

Requirement: ❑ Design to meet building energy efficiency and performance as required by TI 800-01 (Design Criteria).

Technologies /Strategies: Use building modeling and analysis techniques to establish and document compliance. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Refer to the LEED Reference Guide for a wide variety of energy efficiency strategy resources.

Use a professionally recognized and proven computer program or programs that integrate architectural features with air-conditioning, heating, lighting, and other energy producing or consuming systems. These programs will be capable of simulating the features, systems, and thermal loads used in the design. Using established weather data files, the program will perform 8760 hourly calculations. BLAST, DOE-2 or EnergyPlus are acceptable programs for these purposes.

### 3.R3 CFC Reduction in HVAC&R Equipment [2] — Reqd.

Intent: Reduce ozone depletion.

Requirement: ❑ Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Technologies /Strategies: Specify only non-CFC-based refrigerants in all base building HVAC&R systems.

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# 3.0 Energy and Atmosphere (Continued)

## 3.C1 Optimize Energy Performance [1]

Intent: Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirement:

- ☐ Reduce design energy usage (DEU) compared to the energy use budget (EUB) in joules per square meter per year for regulated energy components as described in the requirements of Chapter 11 of the TI 800-01 (Design Criteria), as demonstrated by a whole building simulation. **20**
  - 1 Point will be awarded for every reduction in design energy use of 2.5% for both new and existing facilities for a maximum score of 20 points.

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

Technologies /Strategies: Develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Perform interactive energy use analysis for selected design elements that affect energy performance and document compliance.

Unit of measure for performance shall be annual energy usage in joules per square meter. Life-Cycle energy costs shall be determined using rates for purchased energy, such as electricity, gas, oil, propane, steam, and chilled water and approved by the adopting authority. Refer to the LEED Reference Guide or Whole Building Design Guide for a wide variety of energy efficiency resources and strategies including conservation measures, electromechanical energy efficiency technologies (for example ground-source heat pumps), passive heating and cooling strategies, solar hot water, and daylighting.

Life-Cycle costing will be done in accordance with 10 CFR 436.

Consider installation of an Energy Management and Control System (EMCS), which is compatible with exiting installation systems to optimize performance. Use sensors to control loads based on occupancy, schedule and/or the availability of natural resources use (day light or natural ventilation).

## 3.C2 Renewable Energy [1]

Intent: Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirement:

- ☐ Supply a net fraction of the building's total energy use through the use of on-site renewable energy systems.

| % of Total Annual Energy Usage in Renewables | |
|---|---|
| 5% | **1** |
| 10% | **2** |
| 15% | **3** |
| 20% | **4** |

Technologies /Strategies: Employ the use of on-site non-polluting-source renewable technologies contributing to the total energy requirements of the project. Consider and use high temperature solar and/or geothermal, photovoltaics, wind, biomass (other than unsustainably harvested wood), and bio-gas. Passive solar, solar hot water heating, ground-source heat pumps, and daylighting do not qualify for points under this credit. Credit for these strategies is given in Energy & Atmosphere Credit 1: Optimizing Energy Performance.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 3.0 Energy and Atmosphere (Continued)

**3.C3** **Additional Commissioning** [2]

Intent: Verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.

Requirement: ❑ In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks: 1

1. Conduct a focused review of the design prior to the construction documents phase.
2. Conduct a focused review of the construction documents when close to completion.
3. Conduct a selective review of contractor submittals of commissioned equipment.
4. Develop a system and energy management manual.
5. Have a contract in place for a near-warranty end or post occupancy review.

Items 1, 2, and 3 must be performed by someone other than the designer.

Technologies /Strategies: Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional guidelines.

**3.C4** **<< Deleted >>** [1]

**3.C5** **Measurement and Verification** [1]

Intent: Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement: ❑ Comply with the installed equipment requirements for continuous metering as stated in selected Measurement and Verification Methods - Option B: Retrofit Isolation of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following: 1

- Lighting systems and controls.
- Constant and variable motor loads.
- Variable frequency drive (VFD) operation.
- Chiller efficiency at variable loads (kW/ton).
- Cooling load.
- Air and water economizer and heat recovery cycles.
- Air distribution static pressures and ventilation air volumes.
- Boiler efficiencies.
- Building specific process energy efficiency systems and equipment.
- Indoor water risers and outdoor irrigation systems.

Technologies /Strategies: Design and specify equipment to be installed in base building systems to allow for comparison, management, and optimization of actual vs. estimated energy and water performance. Employ building automation systems to perform M&V functions where applicable. Tie contractor final payments to documented M&V system performance and include in the commissioning report. Provide for ongoing M&V system maintenance and operating plan in building operations and maintenance manuals. Consider installation/base of an Energy Management and Control System (EMCS), which is compatible with exiting installation/base systems to optimize performance.

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## 3.0 Energy and Atmosphere (Continued)

### 3.C6 Green Power [1]

Intent: Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirement: ❑ Engage in a two year contract to purchase the amount of power equal to projected building consumption generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements. **1**

Technologies /Strategies: Purchase power from a provider that guarantees a fraction of its delivered electric power is from net nonpolluting renewable technologies. Begin by contacting local utility companies. If the project is in an open market state, investigate Green Power and Power Marketers licensed to provide power in that state. Grid power that qualifies for this credit originates from solar, wind, geothermal, biomass, or low-impact hydro sources. Low-impact hydro shall comply with the Low Impact Hydropower Certification Program.

### 3.C7 Distributed Generation

Intent: Encourage the development and use of distributed generation technologies, which are less polluting than grid-source energy.

Requirement: ❑ Reduce total energy usage and emissions by considering source energy implications and local cogeneration and direct energy conversion. Generate at least 50% of the building's projected annual consumption by on-site distributed generation sources. **1**

Technologies /Strategies: Investigate the use of integrated generation and delivery systems, such as co-generation, fuel cells, micro-turbines and off-peak thermal storage.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 4.0 Materials and Resources — Score 13

### 4.R1 Storage & Collection of Recyclables [1] — Reqd.

Intent: Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirement:
- ❑ Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.

Technologies /Strategies: Establish a waste management plan which meets requirements of the installation/base environmental and/or solid waste management plans in cooperation with users to encourage recycling. Reserve space for recycling functions early in the building occupancy programming process and show areas dedicated to collection of recycled materials on space utilization plans. Broader recycling support space considerations should allow for collection and storage of the required elements and newspaper, organic waste (food and soiled paper), and dry waste. When collection bins are used, bin(s) should be able to accommodate a 75% diversion rate and be easily accessible to custodial staff and recycling collection workers. Consider bin designs that allow for easy cleaning to avoid health issues.

### 4.C1 Building Reuse [1]

Intent: Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirement: Reuse large portions of existing structures during renovation or redevelopment projects.

- ❑ Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies). — 1
- ❑ Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies). — 1
- ❑ Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems). — 1

Technologies /Strategies: Evaluate retention of existing structure. Consider facade preservation, particularly in installation/base areas. During programming and space planning, consider adjusting needs and occupant use patterns to fit within existing building structure and interior partition configurations. Identify and effectively address energy, structural, and indoor environmental (lead & asbestos) issues in building reuse planning and deconstruction documents. Percentage of reused non-shell building portions will be calculated as the total area (s.f.) of reused walls, floor covering, and ceiling systems, divided by the existing total area (s.f.) of walls, floor covering, and ceiling systems.

### 4.C2 Construction Waste Management [1]

Intent: Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.

Requirement: Develop and implement a waste management plan, quantifying material diversion by weight:

- ❑ Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste. — 1
- ❑ Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris. — 1

Technologies /Strategies: Develop and specify a waste management plan which meets requirements of the installation/base environmental and/or solid waste management plans that identifies licensed haulers and processors of recyclables; identifies markets for salvaged materials; employs deconstruction, salvage, and recycling strategies and processes, includes waste auditing; and documents the cost for recycling, salvaging, and reusing materials. Source reduction on the job site should be an integral part of the plan.

The plan should address recycling of corrugated cardboard, metals, concrete brick, asphalt, land clearing debris (if applicable), beverage containers, clean dimensional wood, plastic, glass, gypsum board, and carpet; evaluate the cost-effectiveness of recycling rigid insulation, engineered wood products and other materials; hazardous materials storage and management; and participation in manufacturers' "take-back" programs to the maximum extent possible. Refer to the LEED Reference Guide for guidelines and references that provide waste management plan development and implementation support including model bid specifications.

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[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 4.0 Materials and Resources (Continued)

### 4.C3 Resource Reuse [2]

Intent: Extend the life cycle of targeted building materials, reducing environmental impacts related to materials manufacturing and transport.

Requirement:

- ❑ Specify salvaged or refurbished materials for 5% of building materials. 1
- ❑ Specify salvaged or refurbished materials for 10% of building materials. 1

Technologies /Strategies: Commonly salvaged building materials include wood flooring/ paneling/cabinets, doors and frames, mantels, iron work and decorative lighting fixtures, brick, masonry and heavy timbers. See the LEED Reference Guide for calculation tools and guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars* (see exclusions) of the salvaged or refurbished material.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: In total dollar calculations, exclude; labor costs; all mechanical and electrical material and labor costs; and project overhead and fees. *If the cost of the salvaged or refurbished material is below market value, use replacement cost to estimate the material value, otherwise use actual cost to the project.

### 4.C4 Recycled Content [1]

Intent: Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.

Requirement:

- ❑ Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. 1
- ❑ Specify an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. 1

Technologies /Strategies: Specify building materials containing recycled content for a fraction of total building materials. Select products and materials with supporting information from the AIA Resource Guide or the EPA Environmentally Preferable Purchasing (EPP) Program. Common building materials and products with recycled content include; wall, partition, and ceiling materials and systems; insulation; tiles and carpets; cement, concrete, and reinforcing metals; structural and framing steel. For products/materials not listed, selection should be made on the basis of EPP criterion and/or:

- Toxicity;
- Embodied energy;
- Production use of water, energy and ozone depleting substances (ODSs);
- Production limits on toxic emissions and effluents;
- Minimal, reusable or recycled/recyclable packaging;
- Impact on indoor environmental quality (IEQ);
- Installation that limits generation of waste;
- Materials that limit waste generation over their life;
- EPA guideline compliance; and
- Harvested on a sustainable yield basis.

See the LEED Reference Guide for a summary of the EPA guidelines and calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of the material that contain recycled content.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees)

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## 4.0 Materials and Resources (Continued)

### 4.C5 Local/Regional Materials [2]

Intent: Increase demand for building products that are manufactured locally, reducing the environmental impacts resulting from transportation, and supporting the local economy.

Requirement:

- ❑ Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles. **1**
- ❑ Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles. **1**

Technologies /Strategies: Specify and install regionally extracted, harvested, and manufactured building materials. Contact the state and local waste management boards for information about regional building materials. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of material that is locally or regionally manufactured.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

### 4.C6 Rapidly Renewable Materials [2]

Intent: Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly renewable materials.

Requirement:

- ❑ Specify rapidly renewable building materials for 5% of total building materials. **1**

Technologies /Strategies: Rapidly renewable resources are those materials that substantially replenish them-selves faster than traditional extraction demand (e.g. planted and harvested in less than a 10 year cycle) and do not result in significant biodiversity loss, increase erosion, air quality impacts, and that are sustainably managed. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of materials that are considered to be rapidly renewable.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

### 4.C7 Certified Wood [2]

Intent: Encourage environmentally responsible forest management.

Requirement:

- ❑ Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers. **1**

Technologies /Strategies: Refer to the Forest Stewardship Council guidelines for wood building components that qualify for compliance to the requirements and incorporate into material selection for the project.

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## 5.0 Indoor Environmental Quality (IEQ) Score 17

**5.R1** **Minimum IAQ Performance** [1] **Reqd.**

Intent: Establish minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.

Requirement: ❑ Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Technologies /Strategies: Include proactive design details that will eliminate some of the common causes of indoor air quality problems in buildings. Introduce standards into the design process early. Incorporate references to targets in plans and specifications. Ensure ventilation system outdoor air capacity can meet standards in all modes of operation. Locate building outdoor air intakes (including operable windows) away from potential pollutants/contaminant sources such as sporulating plants (allergens), loading areas, building exhaust fans, cooling towers, sanitary vents, dumpsters, vehicular exhaust, and other sources. Include operational testing in the building commissioning report. Design cooling coil drain pans to ensure complete draining. Include measures to control and mitigate radon buildup in areas where it is prevalent. Limit humidity to a range that minimizes mold growth and promotes respiratory health.

**5.R2** **Environmental Tobacco Smoke (ETS) Control** [2] **Reqd.**

Intent: Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirement: ❑ Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Technologies /Strategies: Prohibit smoking in the building and/or provide designated smoking areas outside the building in locations where ETS cannot reenter the building or ventilation system and away from high building occupant or pedestrian traffic.

**5.C1** **IAQ Monitoring** [1]

Intent: Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.

Requirement: ❑ Install a permanent carbon dioxide ($CO_2$) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time. **1**

Technologies /Strategies: Install an independent system or make $CO_2$ monitoring a function of the building automation system. Situate monitoring locations in areas of the building with high occupant densities and at the ends of the longest runs of the distribution ductwork. Specify that system operation manuals require calibration of all of the sensors per manufacturer recommendations but not less than one year. Include sensor and system operational testing and initial set point adjustment in the commissioning plan and report. Also consider periodic monitoring of carbon monoxide (CO), total volatile organic compounds (TVOCs), and particulates (including PM10).

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[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 5.0 Indoor Environmental Quality (IEQ) (Continued)

### 5.C2 Increase Ventilation Effectiveness [2]

Intent: Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety, and comfort.

Requirement:

- ❑ For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy. **1**

Technologies /Strategies: Employ architectural and HVAC design strategies to increase ventilation effectiveness and prevent short-circuiting of airflow delivery. Techniques available include use of displacement ventilation, low velocity, and laminar flow ventilation (under floor or near floor delivery) and natural ventilation. Operable windows with an architectural strategy for natural ventilation, cross ventilation, or stack effect can be appropriate options with study of inlet areas and locations. See the LEED Reference Guide for compliance methodology guidelines.

### 5.C3 Construction IAQ Management Plan [2]

Intent: Prevent indoor air quality problems resulting from the construction/renovation process, to sustain long term installer and occupant health and comfort.

Requirement: Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- ❑ During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999). **1**

- ❑ Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445. **1**

Technologies /Strategies: Specify containment control strategies including protecting the HVAC system, controlling pollutant sources, interrupting pathways for contamination, enforcing proper housekeeping and coordinating schedules to minimize disruption. Specify the construction sequencing to install absorptive materials after the prescribed dry or cure time of wet finishes to minimize adverse impacts on indoor air quality. Materials directly exposed to moisture through precipitation, plumbing leaks, or condensation from the HVAC system are susceptible to microbial contamination. Absorptive materials to protect and sequence installation include; insulation, carpeting, ceiling tiles, and gypsum products. Appoint an IEQ Manager with owner's authority to inspect IEQ problems and require mitigation as necessary.

### 5.C4 Low-Emitting Materials [2]

Intent: Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.

Requirement: Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:

- ❑ Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51. **1**
- ❑ Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements. **1**
- ❑ Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program. **1**
- ❑ Composite wood or agrifiber products must contain no added urea-formaldehyde resins. **1**

Technologies /Strategies: Evaluate and preferentially specify materials that are low emitting, non-irritating, nontoxic and chemically inert. Request and evaluate emissions test data from manufacturers for comparative products. Ensure that VOC limits are clearly stated in specifications, in General Conditions, or in each section where adhesives, sealants, coatings, carpets, and composite woods are addressed.

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[2] 

## 5.0 Indoor Environmental Quality (IEQ) (Continued)

### 5.C5 Indoor Chemical and Pollutant Source Control [1]

Intent: Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

Requirement:

- ❑ Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: 1
  - Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

Technologies /Strategies: Design to physically isolate activities associated with chemical contaminants from other locations in the building, providing dedicated systems to contain and remove chemical pollutants from source emitters at source locations. Applicable measures include eliminating or isolating high hazard areas; designing all housekeeping chemical storage and mixing areas (central storage facilities and janitors closets) to allow for secure product storage; designing copy/fax/printer/printing rooms with structural deck to deck partitions and dedicated exhaust ventilation systems; and including permanent architectural entryway system(s) to catch and hold particles to keep them from entering and contaminating the building interior.

Consider utilization of EPA registered anti-microbial treatments in carpet, textile or vinyl wall coverings, ceiling tiles or paints where microbial contamination is a concern. Utilize "breathable" wall finishes where circumstances require, to reduce moisture build-up and prevent microbial contamination. Minimize selection of fibrous materials, e.g. insulation, carpet and padding and flexible fabrics, whose exposed surfaces when exposed to the air stream or occupied space can contribute significant emissions and absorb and re-emit other contaminants over time.

### 5.C6 Controllability of Systems [2]

Intent: Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.

Requirement:

- ❑ Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall. 1
- ❑ Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas. 1

Technologies /Strategies: Provide individual or integrated controls systems that control lighting, airflow, and temperature in individual rooms and/or work areas. Consider combinations of ambient and task lighting control and operable windows for perimeter and VAV systems for non perimeter with a 1:1: 2 terminal box to controller to occupant ratio.

### 5.C7 Thermal Comfort [2]

Intent: Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.

Requirement:

- ❑ Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone. 1
- ❑ Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building. 1

Technologies /Strategies: Integrated envelope and HVAC system design strategies that achieve thermal comfort conditions based on mean radiant temperature, local air velocity, relative humidity, and air temperature. Install and maintain a temperature and humidity monitoring system for key areas of the building (i.e., at the perimeter, and spaces provided with humidity control). This function can be satisfied by the building automation system. Specify in system operation manuals that all sensors require quarterly calibration. Include criteria verification and system operation in commissioning plan and report.

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[1] Adapted material not reviewed or endorsed by U. S. Green Building Council.

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## 5.0 Indoor Environmental Quality (IEQ) (Continued)

**5.C8** **Daylight and Views** [2]

Intent: Provide a connection between indoor spaces and the outdoor environment through the introduction of sunlight and views into the occupied areas of the building.

Requirement:

- ☐ Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight. **1**
- ☐ Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. **1**

Technologies /Strategies: Implement design strategies to provide access to daylight and views to the outdoors in a glare-free way using exterior sun shading, interior light shelves, and /or window treatments. Orient buildings to maximize daylighting options. Consider shallow or narrow building footprints. Employ courtyards, atriums, clerestory windows, skylights, and light shelves to achieve daylight penetration (from other than direct effect or direct rays from the sun) deep into regularly occupied areas of the building.

**5.C9** **Acoustic Environment /Noise Control**

Intent: Provide appropriate acoustic conditions for user privacy and comfort.

Requirement:

- ☐ Minimize environmental noise through appropriate use of insulation, sound-absorbing materials and noise source isolation. **1**

Technologies /Strategies: Evaluate each occupied environment and determine the appropriate layout, materials and furnishings design.

**5.C10** **Facility In-Use IAQ Management Plan**

Intent: Insure the effective management of facility air quality during its life.

Requirement:

- ☐ Perform all of the following: **1**
  - Develop an air quality action plan to include scheduled HVAC system cleaning.
  - Develop an air quality action plan to include education of occupants and facility managers on indoor pollutants and their roles in preventing them.
  - Develop an air quality action plan to include permanent monitoring of supply and return air, and ambient air at the fresh air intake, for carbon monoxide (CO), carbon dioxide (CO 2), total volatile organic compounds (TVOCs), and particulates (including PM10).

Technologies /Strategies: Provide action plan for periodic system maintenance, monitoring, occupant/manager training.

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## 6.0 Facility Delivery Process — Score 7

**6.C1** **Holistic Delivery of Facility**

Intent: Encourage a facility delivery process that actively engages all stakeholders in the design process to deliver a facility that meets all functional requirements while effectively optimizing tradeoffs among sustainability, first costs, life cycle costs and mission requirements.

Requirement:

- ❑ Choose team leaders that are experienced in holistic delivery of facilities. **1**
- ❑ Train the entire team in the holistic delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and design/engineering team members. **1**
- ❑ Identify project goals and metrics. **1**
- ❑ Plan and execute charrettes with team members at critical phases of the facility delivery. **1**
- ❑ Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charrettes and other collaborative processes. **2**
- ❑ Document required results for each phase of project deliverables that achieve the project goals and are measurable throughout the facility life span. **1**

Technologies /Strategies:

Develop performance specifications or choose competitive range of products that meet environmental criteria.

Use automated modeling and analysis tools to assess site and facility design alternatives.

Conduct life-cycle cost analysis (LCCA) in the design process according to the Federal Facilities Council Technical Report, Sustainable Federal Facilities: A Guide To Integrating Value Engineering, Life Cycle Costing, and Sustainable Development, FFC # 142, 2000.

Conduct a full ecological assessment to include soil quality, water resources and flows, vegetation and trees, wildlife habitats and corridors, wetlands, and ecologically sensitive areas to identify the least sensitive site areas for development. Evaluate space utilization/functions to reduce overall space requirements, considering networking, flextime, flexi-place, dual-use, and other strategies to reduce space requirements/optimize facility size.

## 7.0 Current Mission — Score 6

### 7.C1 Operation and Maintenance

Intent: Encourage the development of a facility delivery process that enhances efficient operation and maintenance of the facility.

Requirement:

- ☐ Develop a facility operations and maintenance program to include: **2**
  - Commissioning instructions for all facility systems.
  - Comprehensive facility operations and maintenance instructions for system operation, performance verification procedures and results, an equipment inventory, warrantee information, and recommended maintenance schedule. The instructions should include a comprehensive, preventive maintenance program to keep all facility systems functioning as designed.
  - A periodic training program for occupants, facilities managers, and maintenance staff in all facility operations and maintenance activities.
  - Instructions on sustainable cleaning and pest control practices.
  - Develop a comprehensive site/facility recycling/waste management plan.
- ☐ Provide surfaces, furnishings, and equipment that are appropriately durable, according to life cycle cost analysis. **1**

Technologies /Strategies:

Maintain facility elements, systems and subsystems on a routine maintenance schedule to ensure integrity and longevity.

Perform scheduled cleaning and maintenance activities with nontoxic environmentally preferable cleaning products and procedures. Keep air ducts clean and free of microorganisms through a structured program of preventive maintenance. Clean lighting systems following a regular maintenance schedule to ensure optimum light output and energy efficiency.

Use pesticides and herbicides sparingly and only when necessary with preference to natural methods and materials over poisons and toxic agents.

Use automated monitors and controls for energy, water, waste, temperature, moisture, and ventilation monitors and controls. Turn off the lights, computers, computer monitors, and equipment when not in use. Enable power-down features on office equipment.

### 7.C2 Soldier and Workforce Productivity and Retention

Intent: Provide a high-quality, functional, healthy and safe work environment to promote soldier and workforce productivity and retention.

Requirement:

- Provide a high quality indoor environment to enhance user/occupant quality of life (QOL). **1**
- Provide a highly functional work environment to promote user/occupant work productivity. **1**
- Provide a healthy and safe work environment to sustain QOL and productivity. **1**

Technologies /Strategies:

Use a registered/certified interior designer to provide stimulating interior environments with pleasant colors, surface treatments, room proportions and ceiling heights, external views, natural lighting, and quality detailing for interior furnishings, equipment, materials and finishes. Use IES standards to provide light to occupied space with variations in level, comfortable contrasts, natural color rendition, natural/man-made, and adequate controls to optimize light aesthetic qualities. Provide occupant control of individual work areas configuration, and lighting, thermal and ventilation systems.

Collaborate with end users to identify functional and technical requirements and to perform adjacency studies. Configure occupied space to address the specific workers/occupants functions and activities that will be carried out there. Meet TI 800-01 Design Guide requirements. Design and configure occupied space, and select furniture and equipment using human ergonomics. Identify existing user amenities, such as dining, recreation, socialization, shopping and child care facilities. Identify what amenities should be incorporated into the project or provided in the future, nearby facility. Provide ventilation air in sufficient volume free from natural and man made contaminants.

## 8.0 Future Missions — Score 4

### 8.C1 Functional Life of Facility and Supporting Systems

Intent: Assess the functional life of a facility and its supporting systems to optimize the infrastructure investment.

Requirement:

- Identify how long the designed function is likely to occupy the current facility. **1**
- Identify how long the envelope, structure, HVAC, plumbing, communications, electrical, and other systems are likely to last before requiring replacement or upgrade. Consider economic, functional and physical obsolescence. **1**

Technologies /Strategies: Assess the typical or likely lifespan of the function(s) to be accommodated to forecast eventual adaptation to a different use(s). Assess the life spans of the various building systems/components to forecast their revision/replacement during the facility lifespan and design in a manner that facilitates revision/replacement.

Consider the life span of the weapon systems, doctrines, or other programs supported by the facility.

Use life cycle data and other sources to identify the life span of the embodied systems.

### 8.C2 Adaptation, Renewal and Future Uses

Intent: Encourage facility design that is responsive to change over time to maximize accommodation of future uses without creating waste and insuring maximum useful life of products.

Requirement:

- Identify possible future uses for the facility; consider alternatives that expand the list of possible future uses. AND Design the building to accommodate as wide a range of future uses, as practical. AND Design the installation of building systems to accommodate foreseeable change with a minimum amount of disruption, cost, and additional materials. **1**
- Build the smallest facility necessary to meet current mission functional requirements, using the most efficient shape and form, while taking into consideration expansion capabilities and potential future mission requirements. AND Design the facility for recycling of materials and systems. **1**

Technologies /Strategies: Create durable, long-lasting and adaptable facility shell and structural system. Create an adaptable, flexible facility design using open planning, service corridors, interstitial space, access floors, demountable walls/partitions, modular furniture and other adaptable space configuration/utilization strategies.

Select materials that are recyclable, avoiding composite materials, such as reinforced plastics and carpet fibers and backing. Consider selecting materials and labeling construction materials with identification information to facilitate recycling. Use pre-cut/pre-fabricated materials and use standard lengths and sizes (dimensional modularity) in design. Design facility systems and subsystems for reconfiguration and/or disassembly/recycling using reversible/reusable connectors.

# Facility Points Summary

| | | | | |
|---|---|---|---|---|
| **1.0** | **Sustainable Sites (S)** | **Score** | **0** | **Max 20** |
| 1.R1 | • Erosion, Sedimentation and Water Quality Control | | | [Required] |
| 1.C1 | • Site Selection | | | 2 |
| 1.C2 | • Installation/Base Redevelopment | | | 2 |
| 1.C3 | • Brownfield Redevelopment | | | 1 |
| 1.C4 | • Alternative Transportation | | | 4 |
| 1.C5 | • Reduced Site Disturbance | | | 2 |
| 1.C6 | • Stormwater Management | | | 2 |
| 1.C7 | • Landscape and Exterior Design to Reduce Heat Islands | | | 2 |
| 1.C8 | • Light Pollution Reduction | | | 1 |
| 1.C9 | • Optimize Site Features | | | 1 |
| 1.C10 | • Facility Impact | | | 2 |
| 1.C11 | • Site Ecology | | | 1 |
| **2.0** | **Water Efficiency (W)** | **Score** | **0** | **Max 5** |
| 2.C1 | • Water Efficient Landscaping | | | 2 |
| 2.C2 | • Innovative Wastewater Technologies | | | 1 |
| 2.C3 | • Water Use Reduction | | | 2 |
| **3.0** | **Energy and Atmosphere (E)** | **Score** | **0** | **Max 28** |
| 3.R1 | • Fundamental Building Systems Commissioning | | | [Required] |
| 3.R2 | • Minimum Energy Performance | | | [Required] |
| 3.R3 | • CFC Reduction in HVAC&R Equipment | | | [Required] |
| 3.C1 | • Optimize Energy Performance | | | 20 |
| 3.C2 | • Renewable Energy | | | 4 |
| 3.C3 | • Additional Commissioning | | | 1 |
| 3.C4 | • <<Deleted>> | | | |
| 3.C5 | • Measurement and Verification | | | 1 |
| 3.C6 | • Green Power | | | 1 |
| 3.C7 | • Distributed Generation | | | 1 |
| **4.0** | **Materials and Resources (M)** | **Score** | **0** | **Max 13** |
| 4.R1 | • Storage & Collection of Recyclables | | | [Required] |
| 4.C1 | • Building Reuse | | | 3 |
| 4.C2 | • Construction Waste Management | | | 2 |
| 4.C3 | • Resource Reuse | | | 2 |
| 4.C4 | • Recycled Content | | | 2 |
| 4.C5 | • Local/Regional Materials | | | 2 |
| 4.C6 | • Rapidly Renewable Materials | | | 1 |
| 4.C7 | • Certified Wood | | | 1 |
| **5.0** | **Indoor Environmental Quality (IEQ) [Q]** | **Score** | **0** | **Max 17** |
| 5.R1 | • Minimum IAQ Performance | | | [Required] |
| 5.R2 | • Environmental Tobacco Smoke (ETS) Control | | | [Required] |
| 5.C1 | • IAQ Monitoring | | | 1 |
| 5.C2 | • Increase Ventilation Effectiveness | | | 1 |
| 5.C3 | • Construction IAQ Management Plan | | | 2 |
| 5.C4 | • Low-Emitting Materials | | | 4 |
| 5.C5 | • Indoor Chemical and Pollutant Source Control | | | 1 |
| 5.C6 | • Controllability of Systems | | | 2 |
| 5.C7 | • Thermal Comfort | | | 2 |
| 5.C8 | • Daylight and Views | | | 2 |
| 5.C9 | • Acoustic Environment /Noise Control | | | 1 |
| 5.C10 | • Facility In-Use IAQ Management Plan | | | 1 |

## Facility Points Summary (Continued)

| | | | | Maximum Points |
|---|---|---|---|---|
| **6.0** | **Facility Delivery Process (P)** | **Score** | **0** | **Max 7** |
| 6.C1 | • Holistic Delivery of Facility | | | 7 |
| **7.0** | **Current Mission** | **Score** | **0** | **Max 6** |
| 7.C1 | • Operation and Maintenance | | | 3 |
| 7.C2 | • Soldier and Workforce Productivity and Retention | | | 3 |
| **8.0** | **Future Missions** | **Score** | **0** | **Max 4** |
| 8.C1 | • Functional Life of Facility and Supporting Systems | | | 2 |
| 8.C2 | • Adaptation, Renewal and Future Uses | | | 2 |

**Total Score** 0 Max 100

## SPiRiT Sustainable Project Certification Levels

| | | |
|---|---|---|
| **SPiRiT Bronze** | | **25 to 34 Points** |
| **SPiRiT Silver** | | **35 to 49 Points** |
| **SPiRiT Gold** | | **50 to 74 Points** |
| **SPiRiT Platinum** | | **75 to 100 Points** |

## Project Points of Contact

## SPiRiT Comment Sheet

Please forward any comments that you may have on this Sustainable Project Rating Tool, preferably by Email, to:

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SPiRiT Para.

# Appendix 2

## Project Scopes in Percentages by Primary Facility

Projects often include multiple buildings and facility types. USACE/Army policy is that all Buildings and/or Primary Facilities within a project must be SPiRiT rated, however, only the rating for the primary facility that gives its name to the project, is reported forward in PROMIS. Another way to think about that is that all individual buildings that make up a project are SPiRiT rated, but only the dominant building's rating is reported. Concerns were raised over the validity of this approach. Consideration was given to the provision of an overall project rating, weighted to reflect the percentages in cost and or gross square footage of each primary facility. The following data is taken from Military Construction Project Data (DD1391s) for the validation projects. It displays Primary Facility scopes as a percentage of the overall project scope, in percentage by area and cost, to demonstrate the efficacy of a summary project rating.

### Fort Lewis, WA - Whole Barracks Renewal, NF Area, Phase 1

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Barracks | 104,453 | 58.90% | $ 147.99 | $ | 15,457,999 | 60.43% |
| Soldier Community Building | 5,339 | 3.01% | $ 147.99 | $ | 790,119 | 3.09% |
| Company Operations Facilities | 53,303 | 30.06% | $ 131.74 | $ | 7,022,137 | 27.45% |
| Battalion Headquarters Building | 14,248 | 8.03% | $ 151.71 | $ | 2,161,564 | 8.45% |
| IDS Installation LS | | | | $ | 150,000 | 0.59% |
| | 177,343 | | | $ | 25,581,819 | |

### Fort Richardson, AK - Barracks Complex - D Street, Phase 2

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Barracks | 54,508 | 37.00% | $ 186.06 | $ | 10,141,758 | 32.70% |
| Dining Facility | 22,787 | 15.47% | $ 296.12 | $ | 6,747,686 | 21.76% |
| Company Operations Facilities | 70,008 | 47.53% | $ 196.27 | $ | 13,740,470 | 44.31% |
| Antiterrorism Force Protection LS | | | | $ | 306,000 | 0.99% |
| IDS Installation LS | | | | $ | 76,000 | 0.25% |
| | 147,303 | | | $ | 31,011,915 | |

### Fort Polk, LA - Consolidated Library/General Education Center

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Main Post Library | 29,640 | 46.49% | $ 108.00 | $ | 3,201,120 | 43.82% |
| Education Center | 34,110 | 53.51% | $ 107.00 | $ | 3,649,770 | 49.96% |
| Antiterrorism Force Protection LS | | | | $ | 142,000 | 1.94% |
| Building Information Systems LS | | | | $ | 312,000 | 4.27% |
| | 63,750 | | | $ | 7,304,890 | |

## Fort Gordon, GA - Installation Communications Facility

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Communications Center | 41,000 | 100.00% | $ 169.18 | $ | 6,936,380 | 80.88% |
| EMCS Connection LS | | | | $ | 62,000 | 0.72% |
| Antiterrorism Force Protection LS | | | | $ | 274,000 | 3.19% |
| IDS Installation LS | | | | $ | 3,000 | 0.03% |
| Migrate Switch LS | | | | $ | 700,000 | 8.16% |

## Fort Meade, MD - Child Development Center

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Child Development Center | 24,047 | 43.88% | $ 122.00 | $ | 2,933,734 | 74.19% |
| Storage Shed | 450 | 0.82% | $ 21.55 | $ | 9,698 | 0.25% |
| Playground w/Equipment | 30,300 | 55.29% | $ 12.64 | $ | 382,992 | 9.69% |
| Antiterrorism Force Protection LS | | | | $ | 557,000 | 14.09% |
| EMCS Connection LS | | | | $ | 22,000 | 0.56% |
| Building Information Systems LS | | | | $ | 49,000 | 1.24% |
| | 54,797 | | | $ | 3,954,424 | |

## Camp Carroll, Korea - Physical Fitness Training Center

| Primary Facility | Area (SF) | % by Area | Unit Cost | | Total | % by Cost |
|---|---|---|---|---|---|---|
| Physical Fitness Center | 40,881 | 100.00% | $ 162.08 | $ | 6,625,992 | 94.07% |
| EMCS Connection LS | | | | $ | 62,000 | 0.88% |
| Antiterrorism Force Protection LS | | | | $ | 266,000 | 3.78% |
| Building Information Systems LS | | | | $ | 90,000 | 1.28% |
| | 40,881 | | | $ | 7,043,992 | |

## Appendix 3

## SDD Guidance and Timeline

**30 June 1998** – USACE Issues Guidance on the Sustainable Design and Construction of all New Army Facilities, and the Rehabilitation/Renovation of Existing Facilities. [Engineering Technical Letter (ETL) 1110 3-491, CEMP-ET, Engineering and Design, *Sustainable Design For Military Facilities*, Dated: 30 June 1998, Superceded 01 May 2001, ETL 1110-3 491]

**30 November 1999** - USACE Issues Updated Guidance on the Sustainable Design and Construction of all New Army Facilities, and the Rehabilitation/Renovation of Existing Facilities. [ETL 1110 3-491, CEMP-ET, Engineering and Design, *Sustainable Design For Military Facilities*, Dated: 30 June 1998, Superceded 01 May 2001, ETL 1110-3 491]

**26 April 2000** – Assistant Secretariat of the U. S. Army Implements Sustainable Design and Development Initiative. [Memorandum, OASA(I&E) (Paul W. Johnson), Dated 26 April2000, Subject: Sustainable Design and Development, http://www.hqda.army.mil/acsimweb/fd/docs/SDD.PDF ]

**26 May 2000** – ACSIM Implements Sustainable Design and Development Policy for the Incorporation of SDD Concepts and Principles into Installation Facilities Planning Decisions and Infrastructure Projects. [Memorandum, DAIM-FD (MG R. L. Antwerp), Dated: 26 May 2000, Subject: Sustainable Design and Development (SDD) Policy, http://www.hqda.army.mil/acsimweb/fd/docs/SDD-ACSIM.PDF]

**01 May 2001** -- USACE Issues Updated ETL 1110-3-491 Introducing the Sustainable Project Rating Tool (SPiRiT). [ETL 1110 3-491, CEMP-ET, Engineering and Design, *Sustainable Design for Military Facilities*, Dated: 01 May 2001 http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/etl1110-3-491/toc.htm]

**04 May 2001** – ACSIM Implements Policy on the Use of SPiRiT as the Army's Tool for the Evaluation of the Sustainability of Facility Construction and Repair Projects and Sets the Minimum Level as Bronze. [Memorandum, DAIM-FD (MG R. L. Antwerp), Dated: 04 May 2001, Subject: Sustainable Project Rating Tool (SPiRiT), http://www.hqda.army.mil/acsimweb/fd/docs/spirit.pdf]

**01 June 2001** – USACE Implements ACSIM Policy Throughout the U. S. Army Corps of Engineers. [Memorandum, CECW-ET (BG Steven R. Hawkins), Dated: 01 June 2001, Subject: Sustainable Design and Development (SDD), http://www.hqda.army.mil/acsimweb/fd/docs/sustainable2.pdf

**18 March 2002** -- Assistant Secretariat of the U. S. Army Implements Minimum Requirement for Bronze SPiRiT Rating, and Targets Selected Showcase Projects for Gold and silver Ratings. [Memorandum, OASA(I&E) (Mario P. Fiori), Dated: 18 Mar 2002, Subject: Sustainable Design and Development, http://www.hqda.army.mil/acsimweb/fd/docs/SDDMemo.PDF]

**03 June 2002** -- Assistant Secretariat of the U. S. Army Implements Guidance of the Use of Planning (Programming) Charrette Processes for Military Construction, Army (MCA) Projects. [Memorandum, OASA(I&E) (Joseph W. Whitaker), Dated: 03 June 2002, Subject: Planning Charrettes Process for Military Construction, Army, Projects, http://www.hqda.army.mil/acsimweb/fd/virlibrary/virtualLibrary/docs/DASACharretteMemoEncl2.pdf]

**04 June 2002** -- USACE Issues Updated Guidance on SPiRiT. [Engineering and Construction Bulletin (ECB) 2002-15, CECW-ETV, Dated: 04 June 02, Subject: *Sustainable Project Rating Tool (SPiRiT)* (Superceded by ECB 2003-20)]

**28 June 2002** -- USACE Issues Guidance on Charrettes in the MILCON Process. [ECB 2002-16, CEMP-MA/CECW-EI, Dated: 28 June 02, Subject: *DD Form 1391 Preparation Planning Charrette Process*, (Superceded by ECB 2003-8)]

**21 December 2002** –ACSIM Implements Policy Raising the Minimum SPiRiT Rating to Silver Beginning with for all MILCON Projects Beginning with the FY06 Program [Memorandum, DAIM-ZA (MG Larry J. Lust), Dated: 21 December 2002, Subject: Sustainable Project Rating Tool, http://www.hqda.army.mil/acsimweb/fd/docs/SustainableProjectRatingTool.pdf]

**04 February 2003** – USACE Implements ACSIM Policy for Sliver Rated Projects. [Memorandum, CECW-ET (MG Carl A. Strock), Dated: 04 February 2003, Subject: Sustainable Design and Development (SDD), http://www.hqda.army.mil/acsimweb/fd/docs/03Feb4SustainableDesignandDevelopment.pdf]

**03 Mar 2003** -- ACSIM Implements Policy of the Funding of MILCOM Planning Charrettes. [Memorandum, DAIM-ZA (MG Larry J. Lust), Dated: 03 March 2003, Subject: Planning Charrette for Military Construction, Army (MCA) Projects]

**18 Mar 2003** -- Assistant Secretariat of the U. S. Army Raises the Bar for Sustainable Design and Development of Army Facilities to Gold. [Memorandum, OASA(I&E) (Mario P. Fiori), Dated: 18 Mar 2003, Subject: Sustainable Design and Development Requirements, http://www.hqda.army.mil/acsimweb/fd/docs/Gold%20Standard.pdf

**11 April 2003** – USACE Implements Army Policy of Gold for FY06 MILCON Projects. Memorandum, CECW-EE (Dwight A. Beranek, P.E.), Dated: 11 April 2003, Subject: Sustainable Design and Development (SDD), http://www.hqda.army.mil/acsimweb/fd/docs/03Apr11%20RAISE%20TO%20GOLD2.doc.pdf

**11 April 2003** USACE Issues Updated Guidance on Charrettes in the MILCON Process. [ECB 2003-8, CEMP-MA/CECW-EI, Dated: 11 April 2003, Subject: DD Form 1391 Preparation Planning Charrette Process, http://www.hnd.usace.army.mil/techinfo/ECB/ECB%202003-8%20(Rev.1).pdf

**24 Nov 2003** -- USACE Issues Updated Guidance on SPiRiT. [ECB 2003-20, CECW-EE, Dated: 24 Nov 2003, Subject: Sustainable Project Rating Tool (SPiRiT), http://www.hnd.usace.army.mil/techinfo/ECB/ECB%202003-20.pdf]